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RESEARCH MEMORANDUM

WEIGHT BAR CHARTS

By B. J. Saelman and H. W. Vick

Lockheed Aircraft Corporation

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NATIONAL ADVISORY COMMITTEE
FOR AERONAUTICS

WASHINGTON

June 25, 1953

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

RESEARCH MEMORANDUM

WEIGHT BAR CHARTS

By B. J. Saelman and H. W. Vick

INTRODUCTION

The weight breakdowns in bar chart form in the present report have been prepared to give an indication of "how we spend our weight." They are expected to focus attention on the design functions that warrant weight reduction activity on future models.

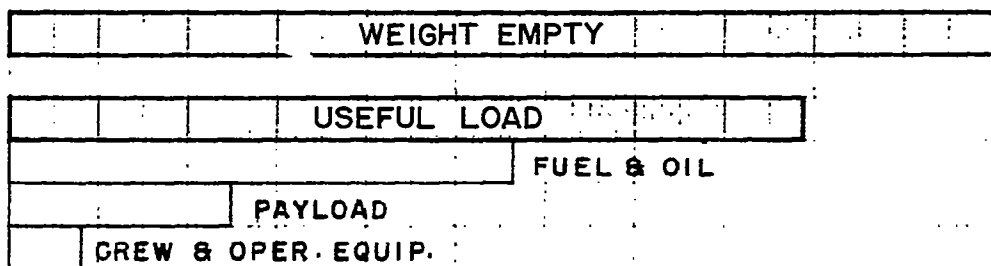
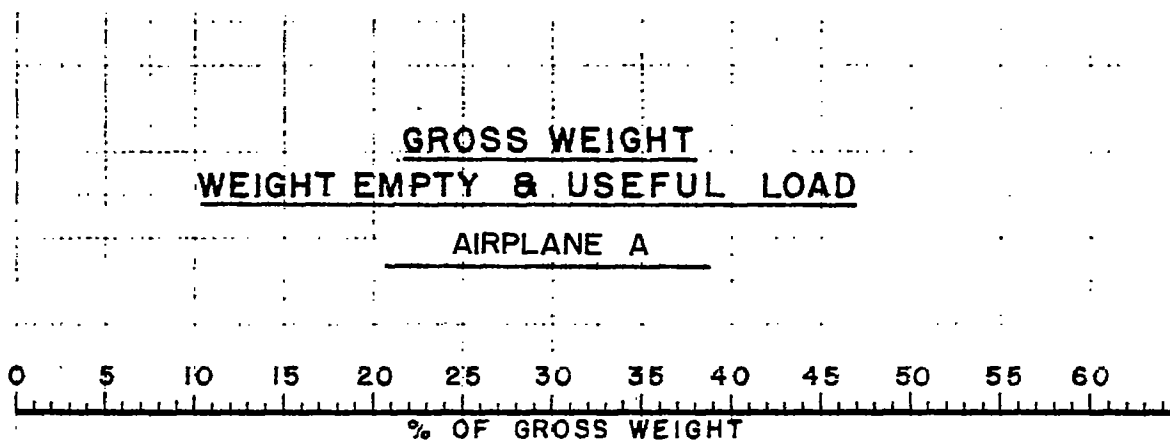
It will be noted that the weight empty and the gross weight, for each of the three airplanes identified herein as airplanes A, B, and C, are given on the first chart for each airplane and the percentages may be converted into pounds by using these weight figures. An index of these charts is presented as table I.

The present paper was originally prepared in 1951 for internal use by the Lockheed Aircraft Corporation, California Division as Report No. 8178, and it was subsequently made available to the National Advisory Committee for Aeronautics in connection with certain studies being made at the Langley Aeronautical Laboratory for the NACA Subcommittee on Aircraft Loads. It was later decided that the information in the paper would be helpful to many persons interested in the aircraft design and the present adaptation of the original report was thus prepared for NACA release.

Lockheed Aircraft Corporation,
Burbank, Calif., May 6, 1953.

TABLE I.- INDEX OF CHARTS

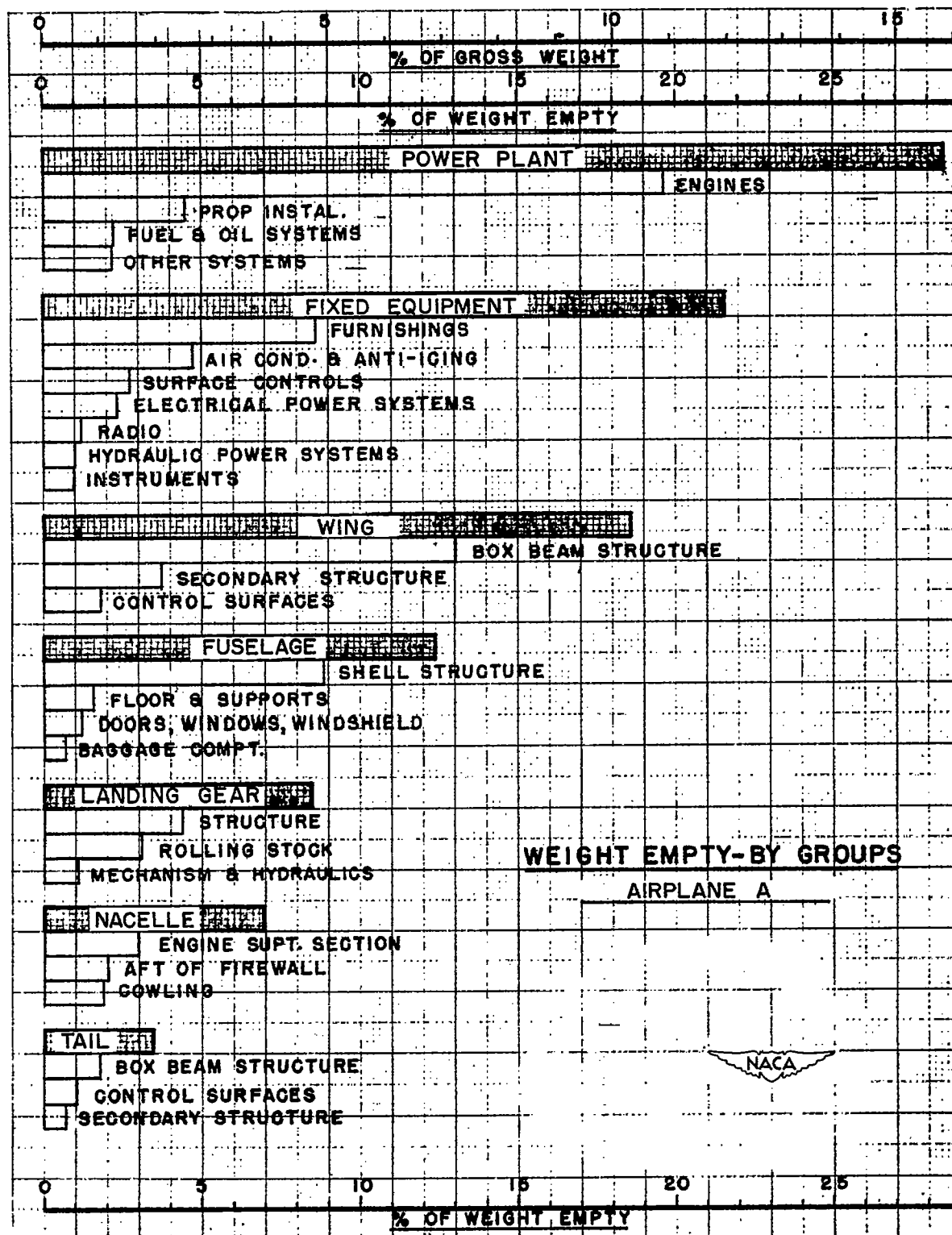
Title of chart	Chart	Page number for -		
		Airplane A	Airplane B	Airplane C
Gross weight:				
Weight empty and useful load	1	3	23	43
Weight empty:				
By groups	2	4	24	44
By function	3	5	25	45
Structure and nonstructure:				
By groups	4	6	26	46
By materials	5	7	27	47
Lockheed and non-Lockheed design:				
By groups	6	8	28	48
By materials	7	9	29	49
By forms of materials	8	10	30	50
Structure:				
By function	9	11	31	51
Designed by flight loads, ground loads:				
By groups	10	12	32	52
Structural producibility:				
By groups	11	13	33	53
By function	12	14	34	54
Lockheed design:				
Stressed and nonstressed	13	15	35	55
Safety features:				
By groups	14	16	36	56
By function	15	17	37	57
Payload (mission) accomodations and crew accomodations:				
By function	16	18	38	58
Service features:				
By groups	17	19	39	59
By function	18	20	40	60
Airplane control:				
By groups	19	21	41	61
By function	20	22	42	62

**NOTES:**

1. THIS BREAKDOWN IS REPRESENTATIVE OF THE AIRPLANE-A STANDARD ARRANGEMENT. WEIGHT EMPTY = 59,423 LBS., AND GROSS WEIGHT = 107,000 LBS.
2. PAYLOAD CONSISTS OF 46 PASSENGERS AT 165 LBS. EA., AND 434 CU. FT. OF CARGO AT 13 LBS. PER CU. FT.



Chart A-2



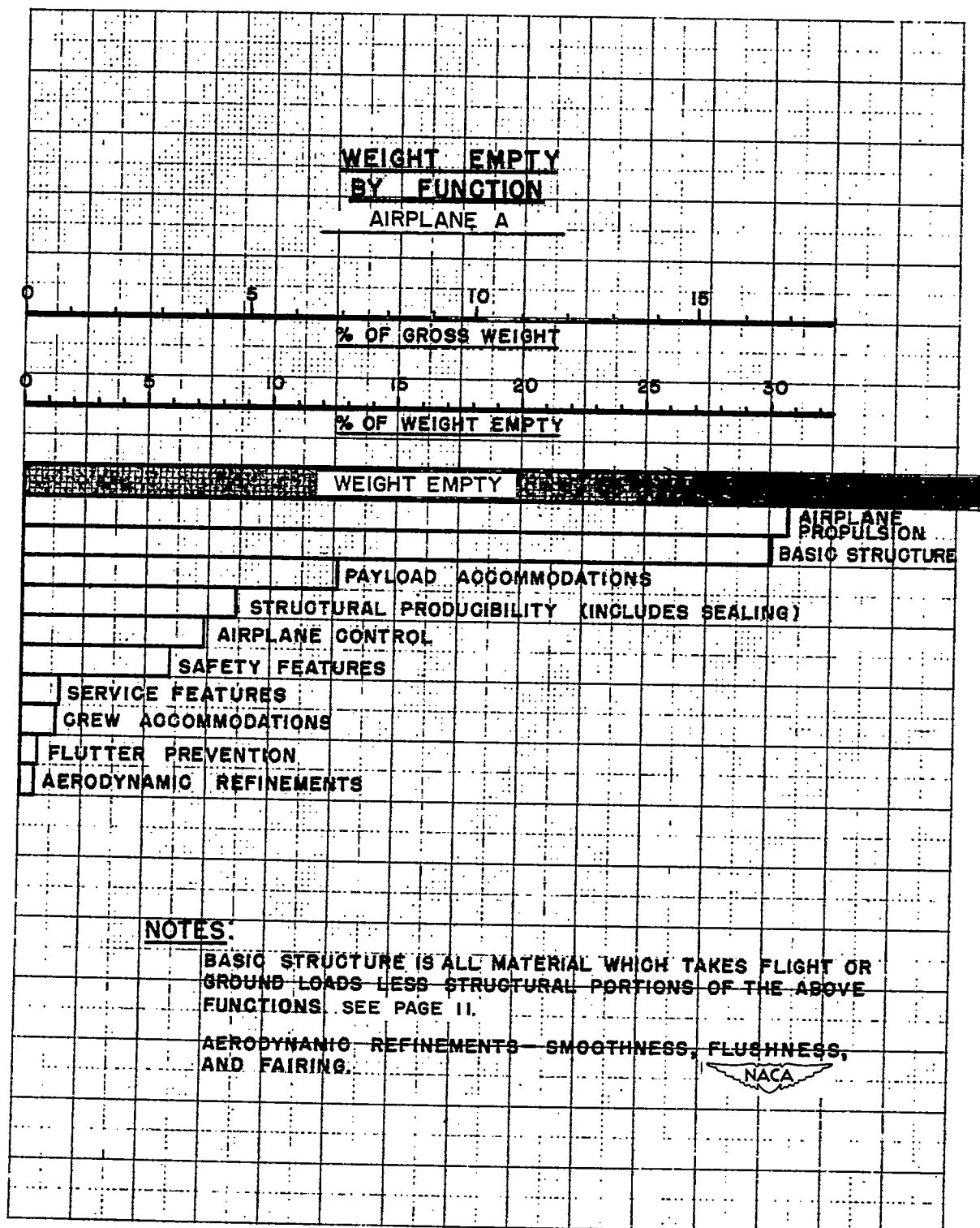


Chart A-4

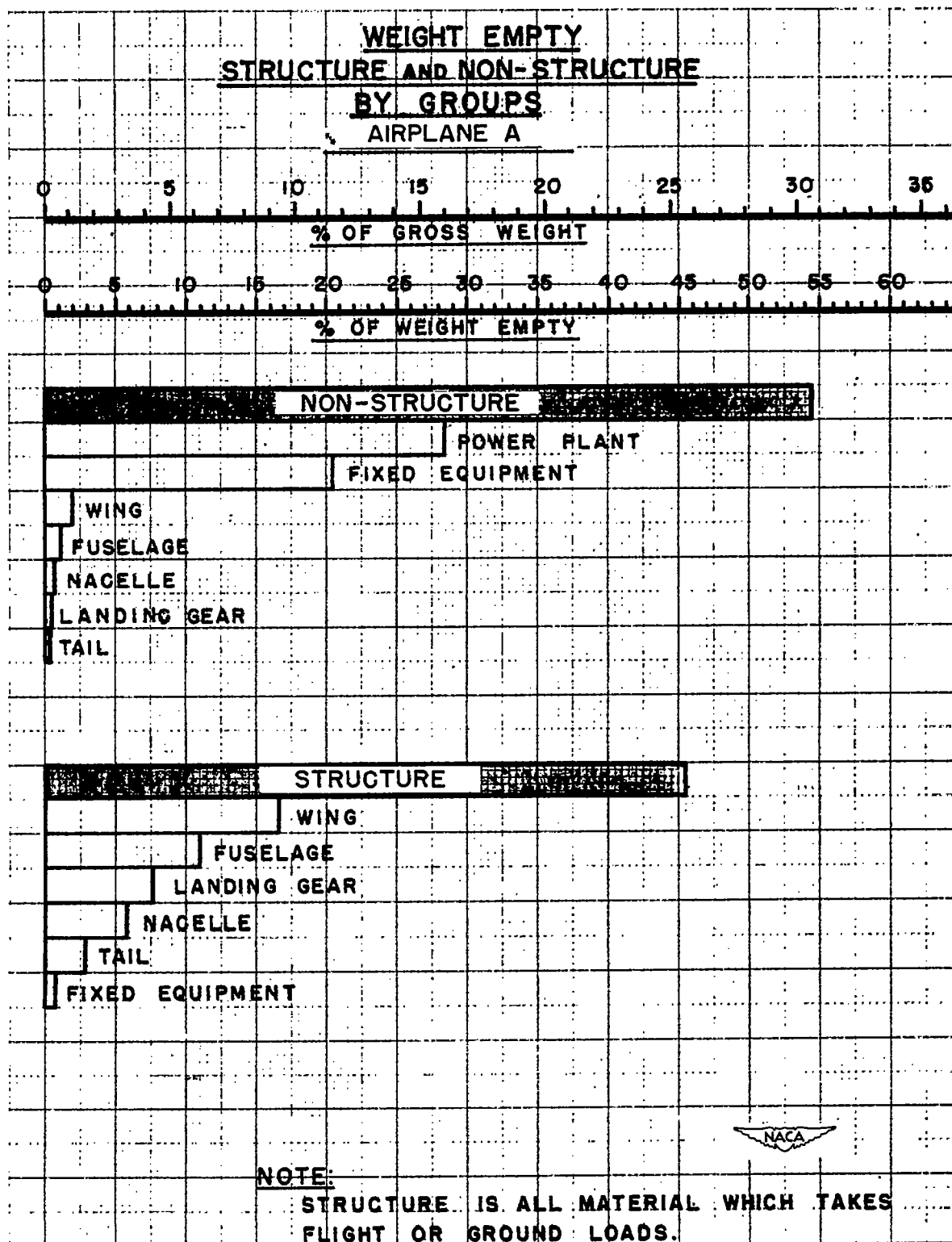


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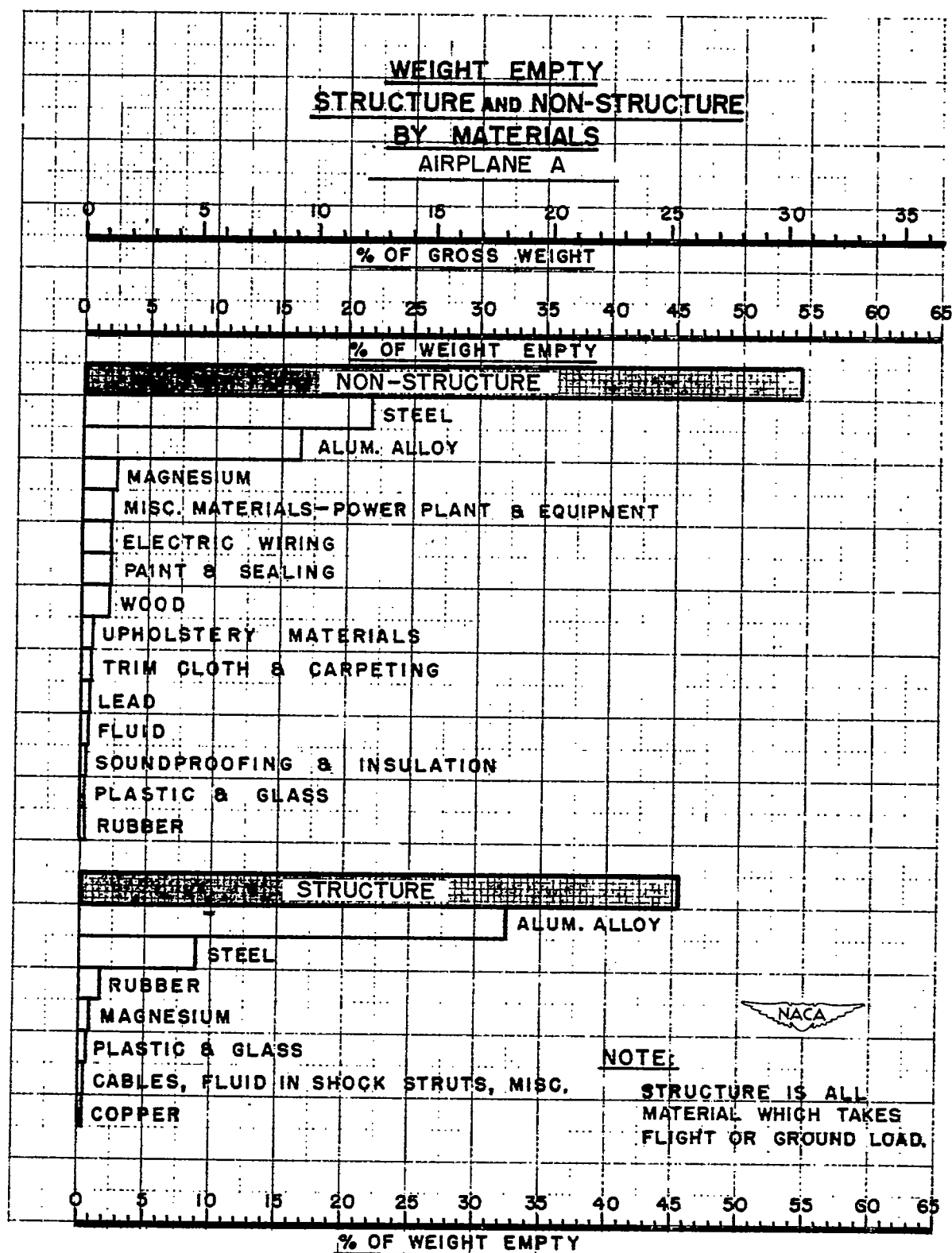
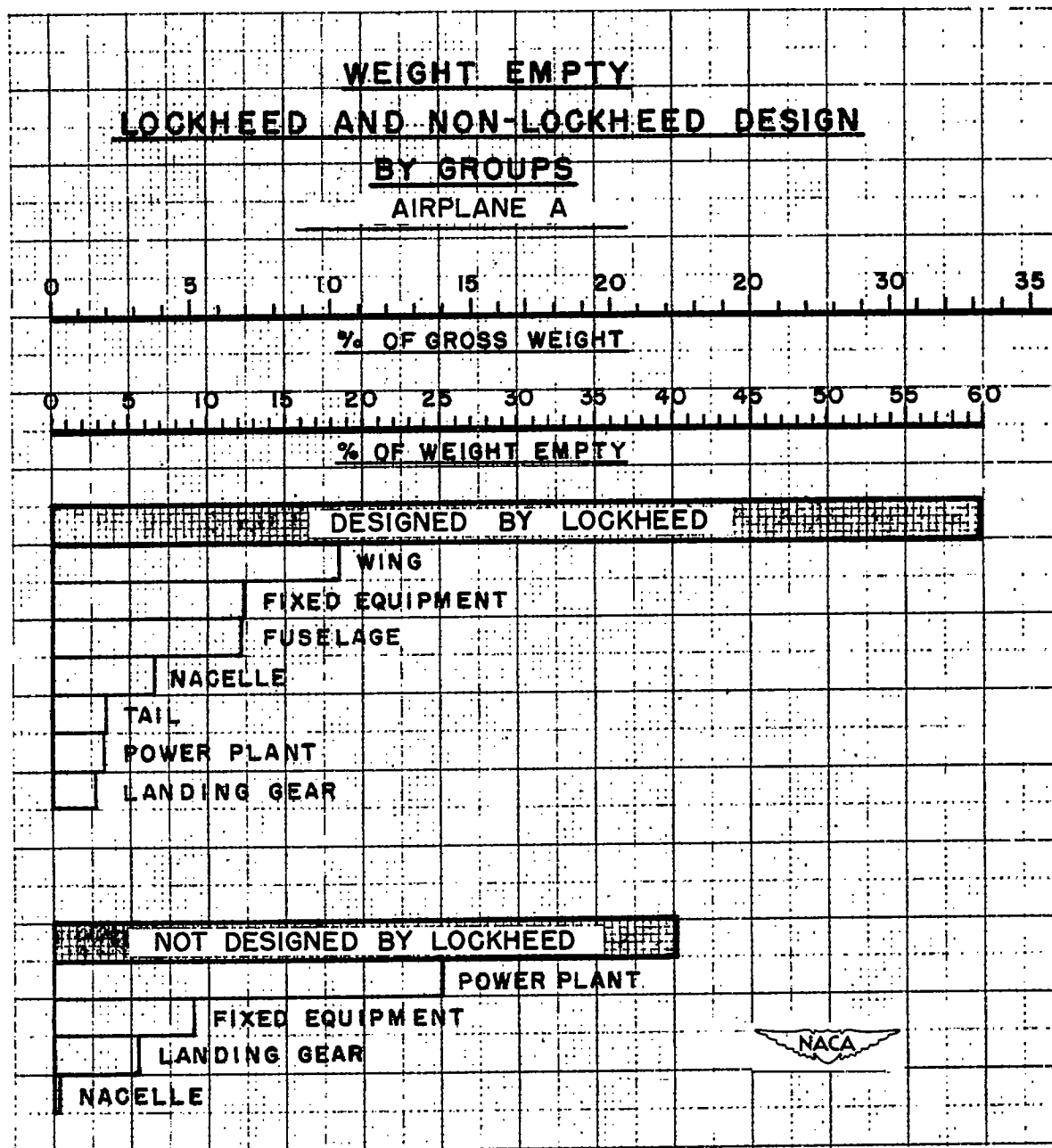


Chart A-6



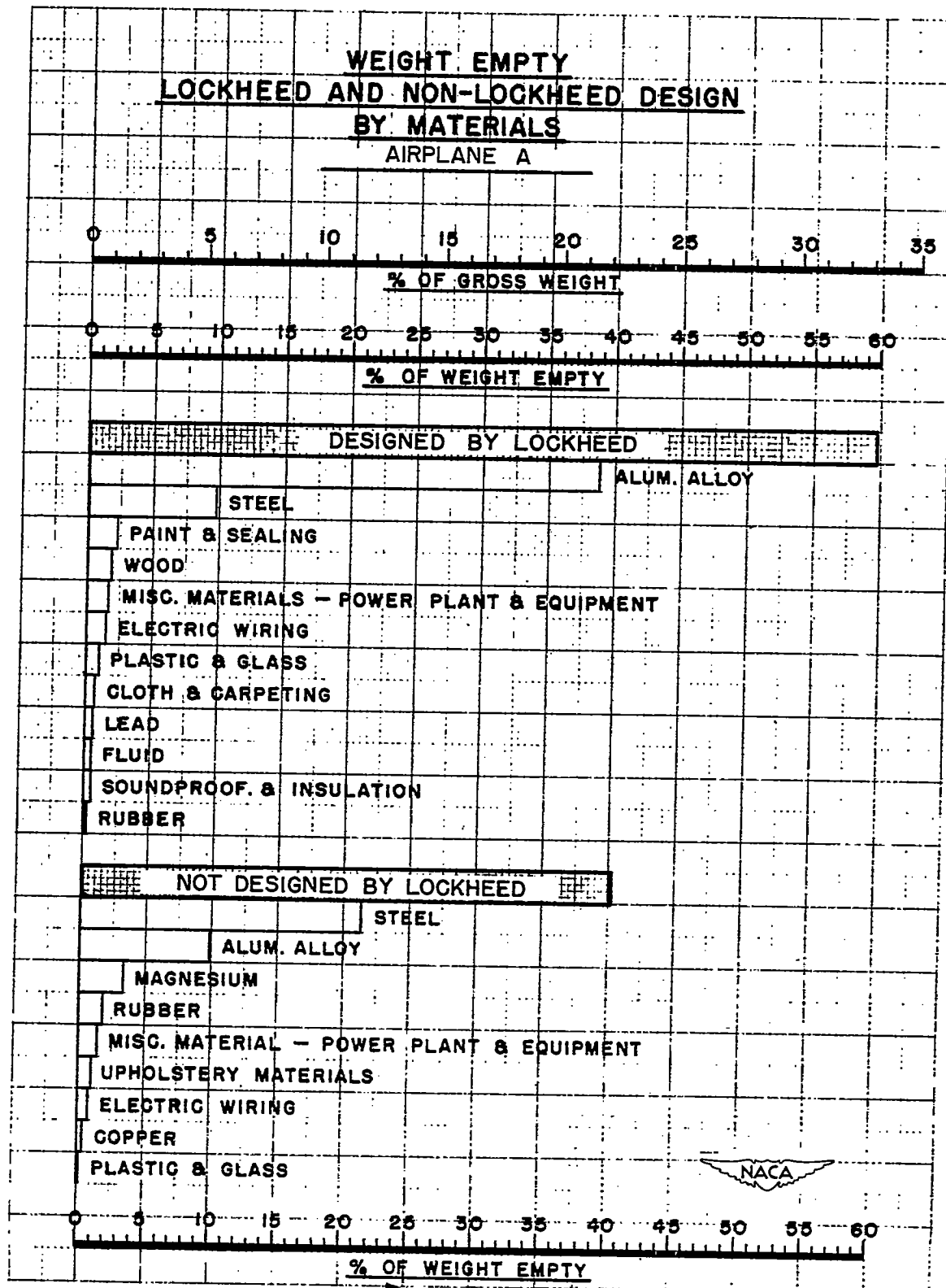


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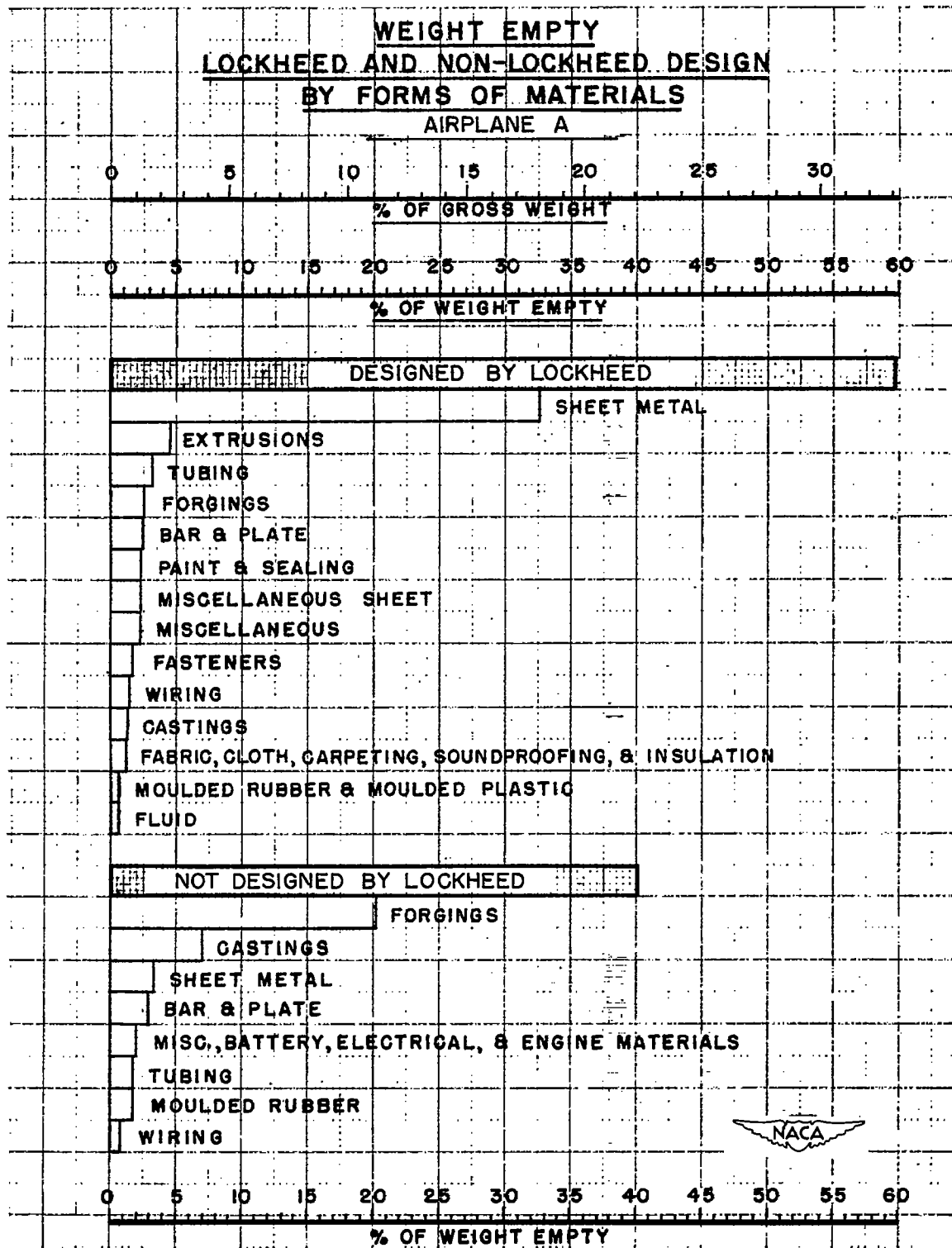


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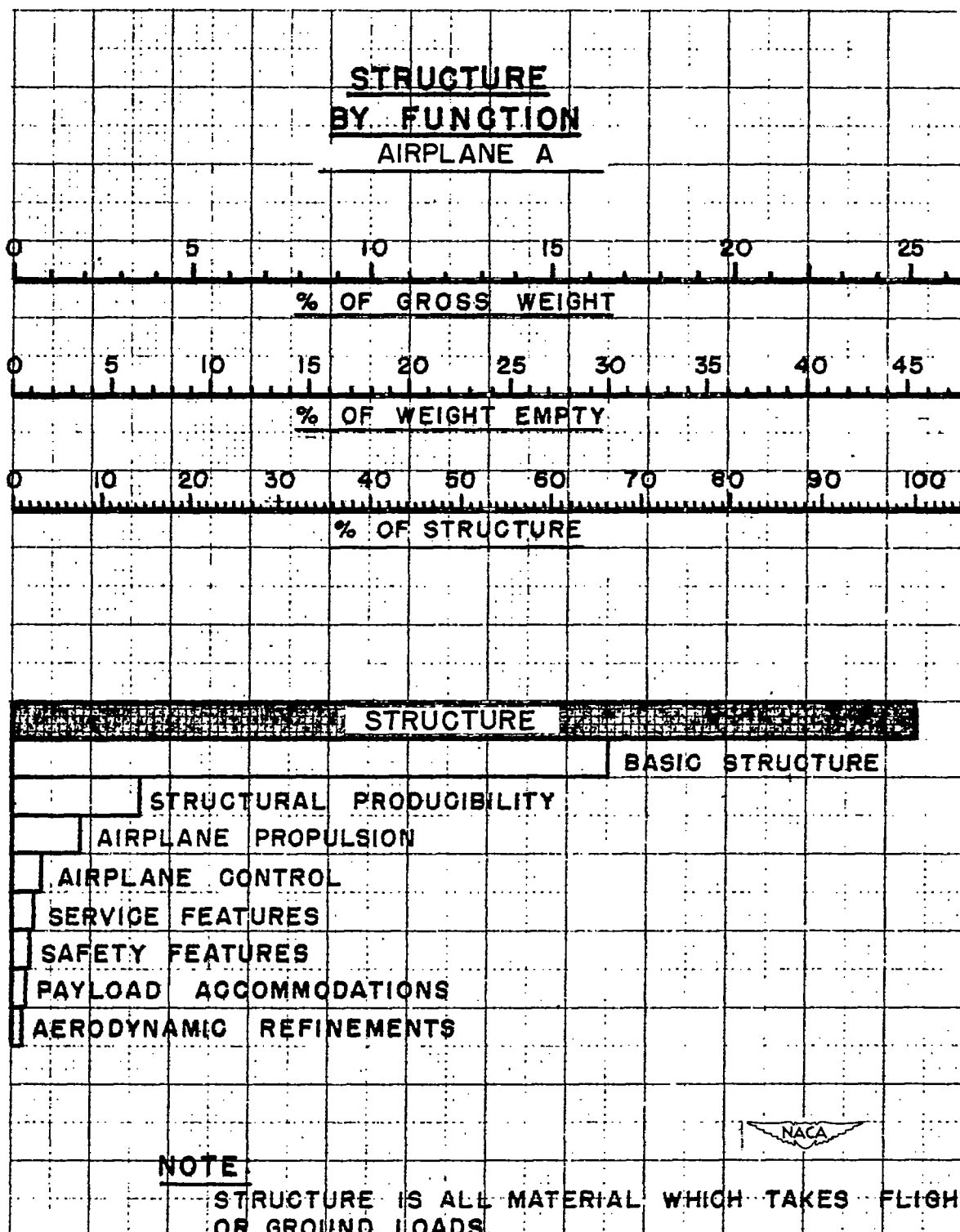


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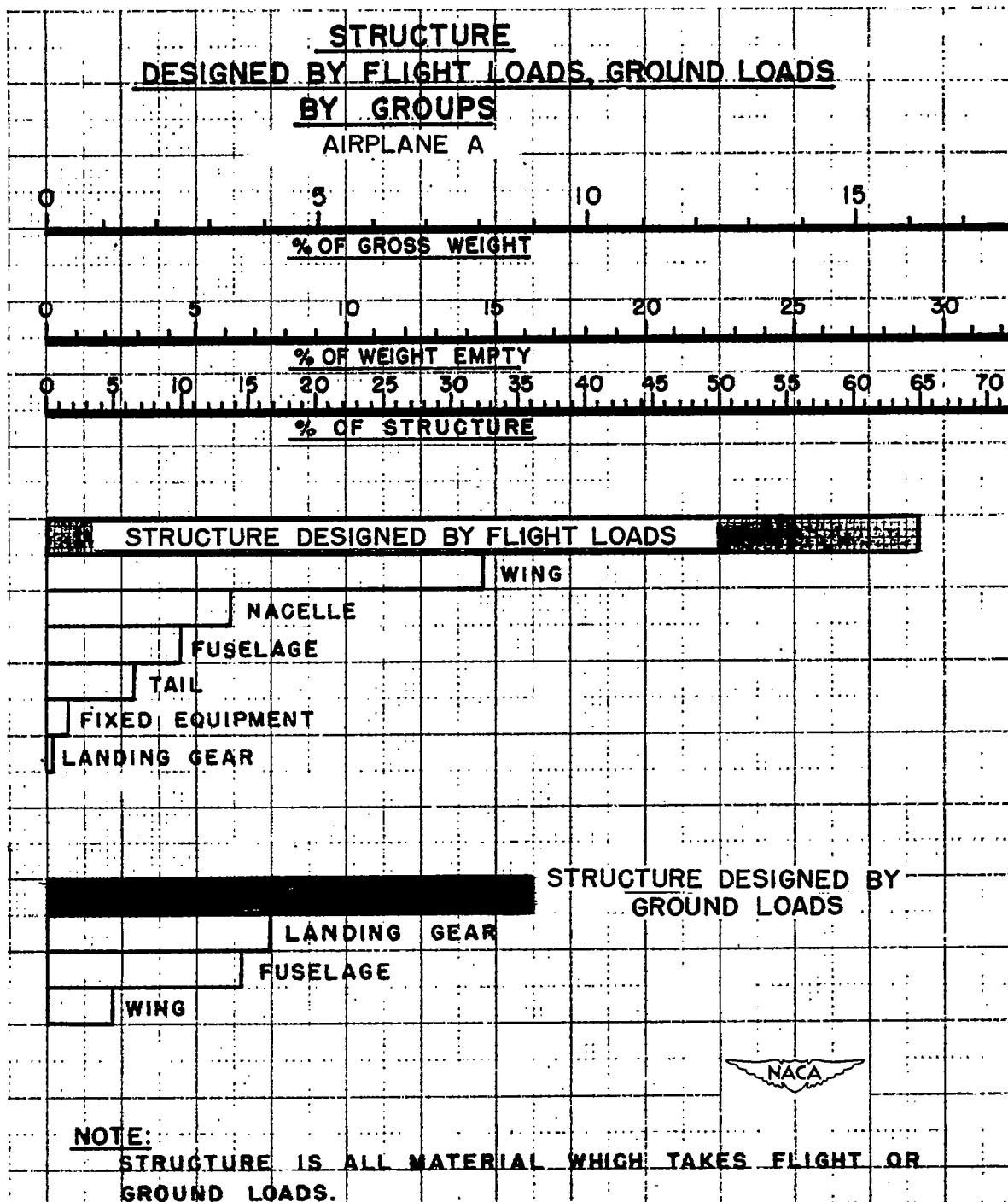


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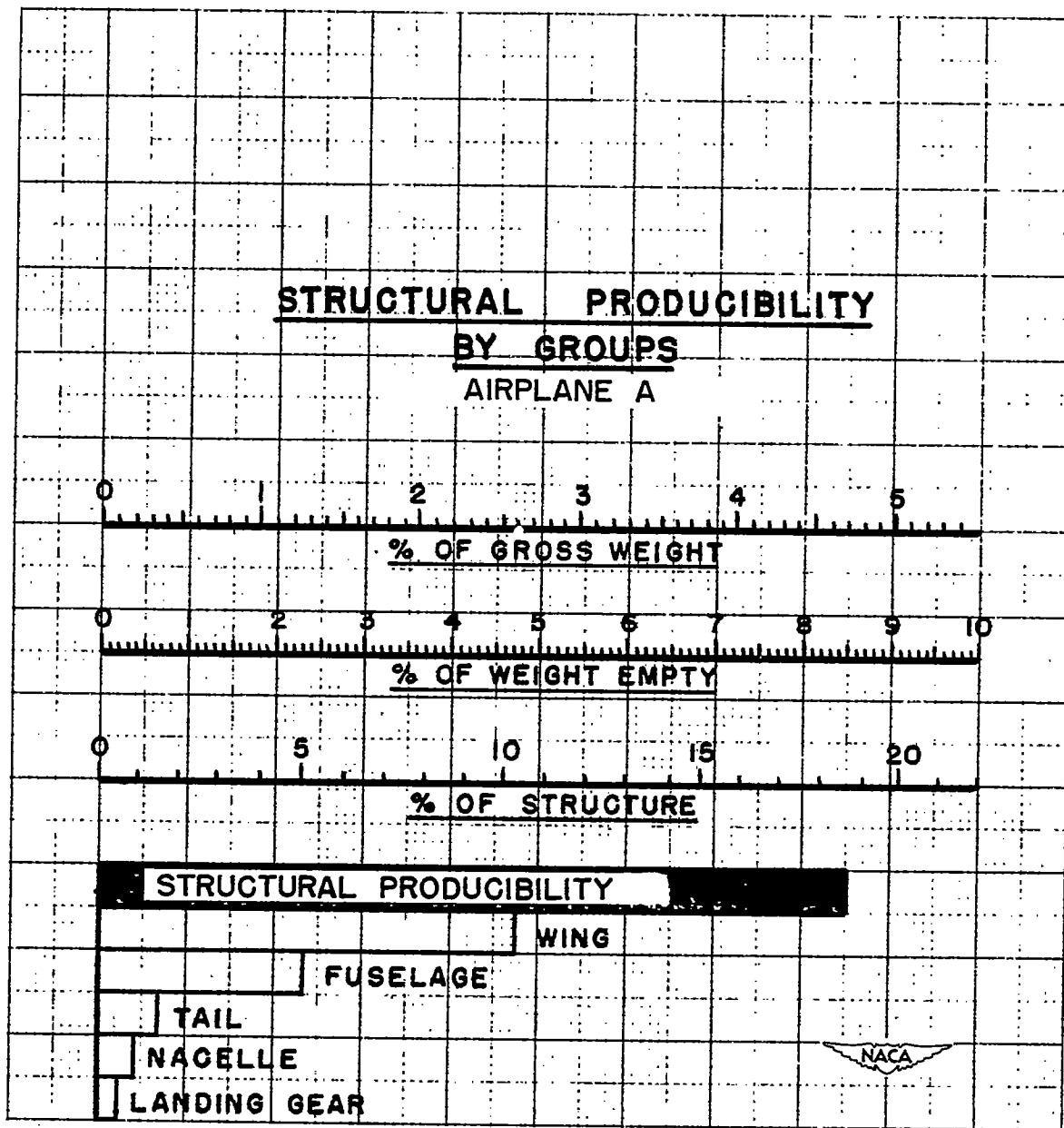


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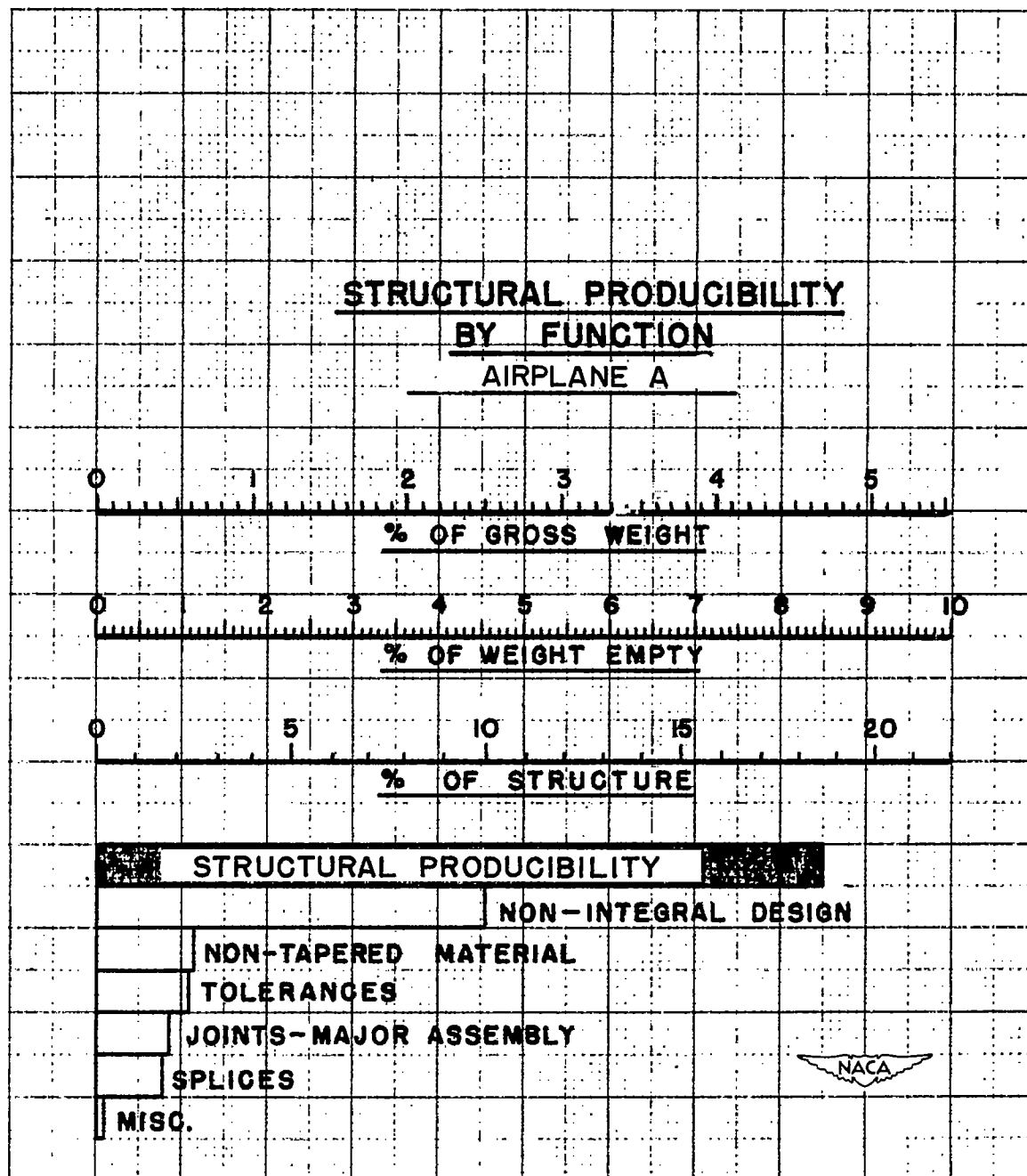


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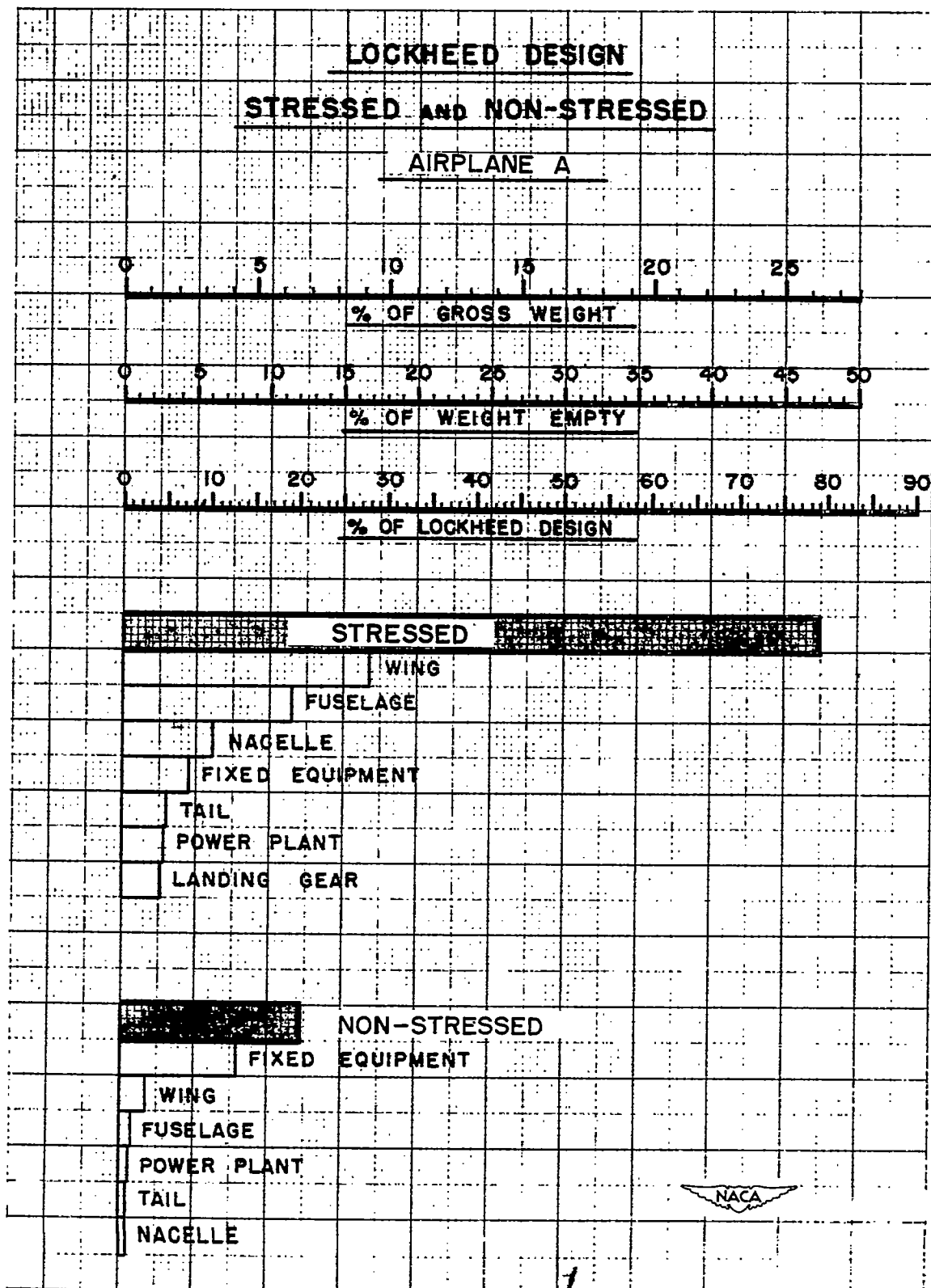
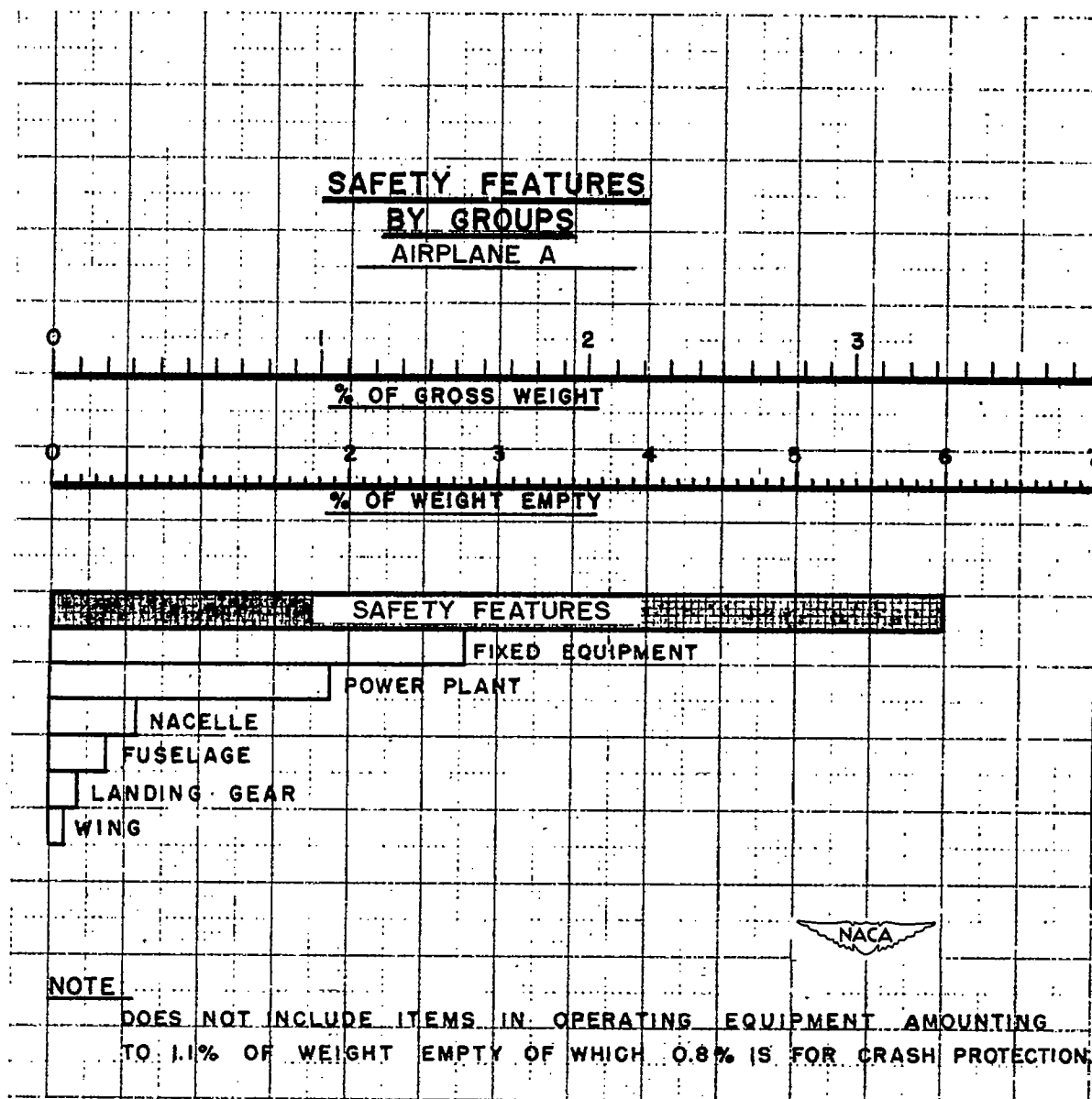


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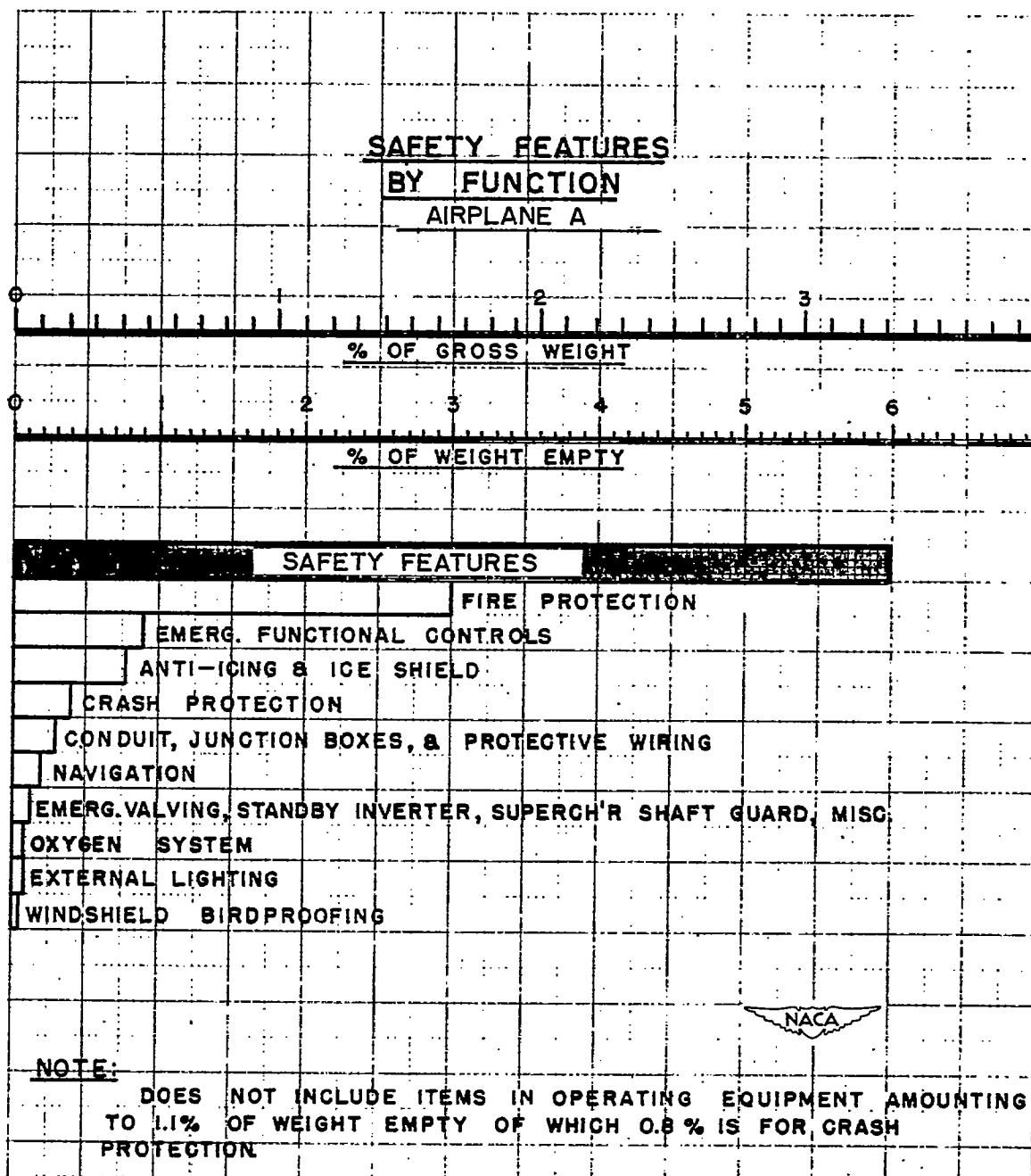
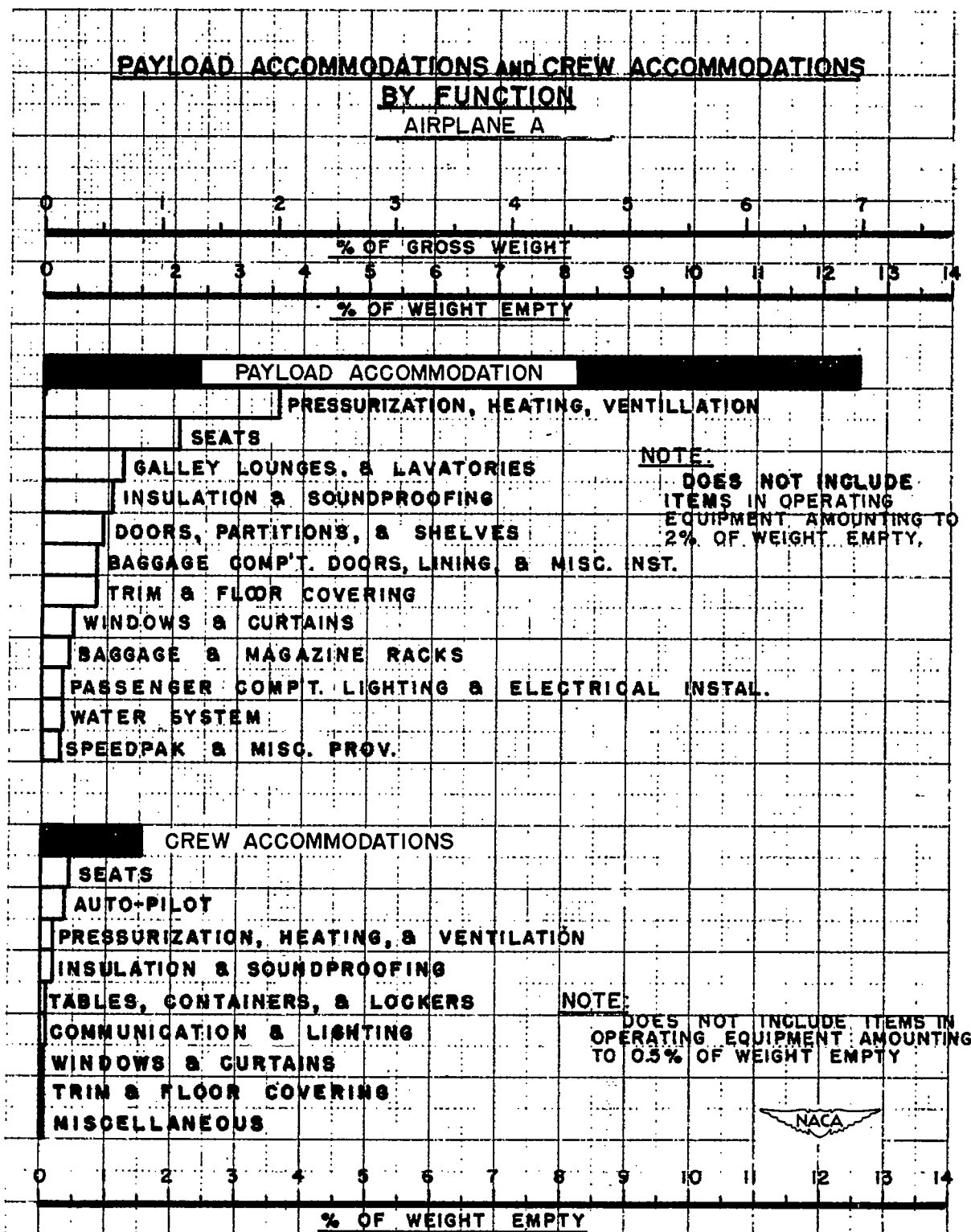


Chart A-16



SERVICE FEATURES
BY GROUPS
AIRPLANE A

0
% OF GROSS WEIGHT

0 2
% OF WEIGHT EMPTY

SERVICE FEATURES

NACELLE

WING

FUSELAGE

LANDING GEAR

FIXED EQUIPMENT

TAIL

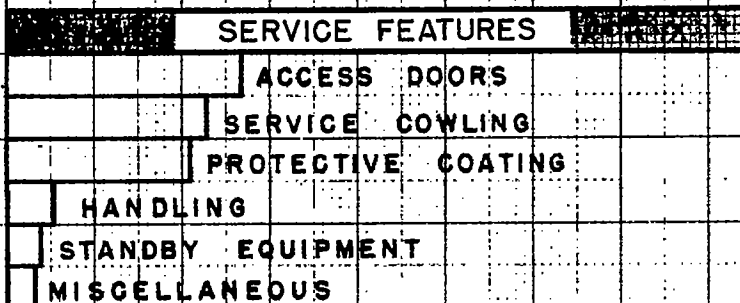
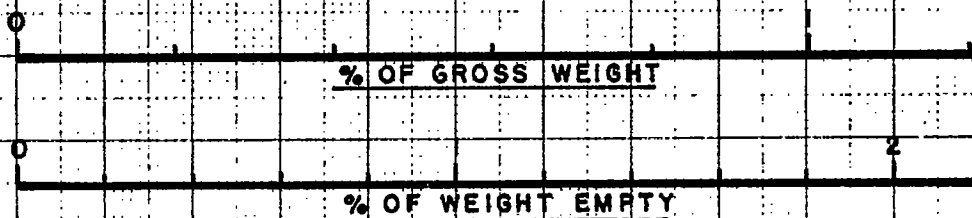
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NOTE:

DOES NOT INCLUDE PROVISIONS FOR SERVICE LIFE OTHER
THAN PROTECTIVE COATING.

Chart A-18

**SERVICE FEATURES
BY FUNCTION
AIRPLANE A**



NOTE:

DOES NOT INCLUDE PROVISION FOR SERVICE LIFE OTHER
THAN PROTECTIVE COATING.

Chart A-19

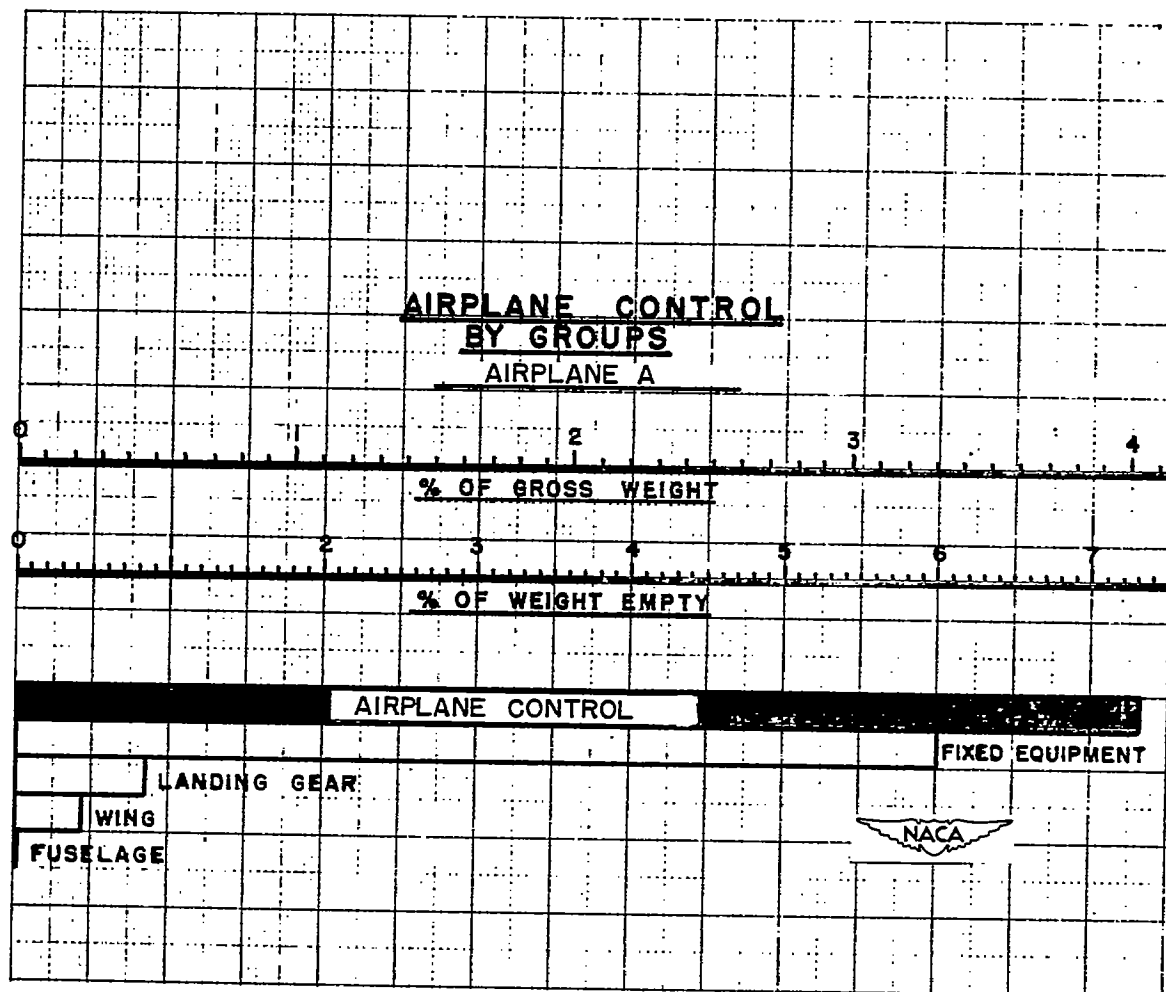


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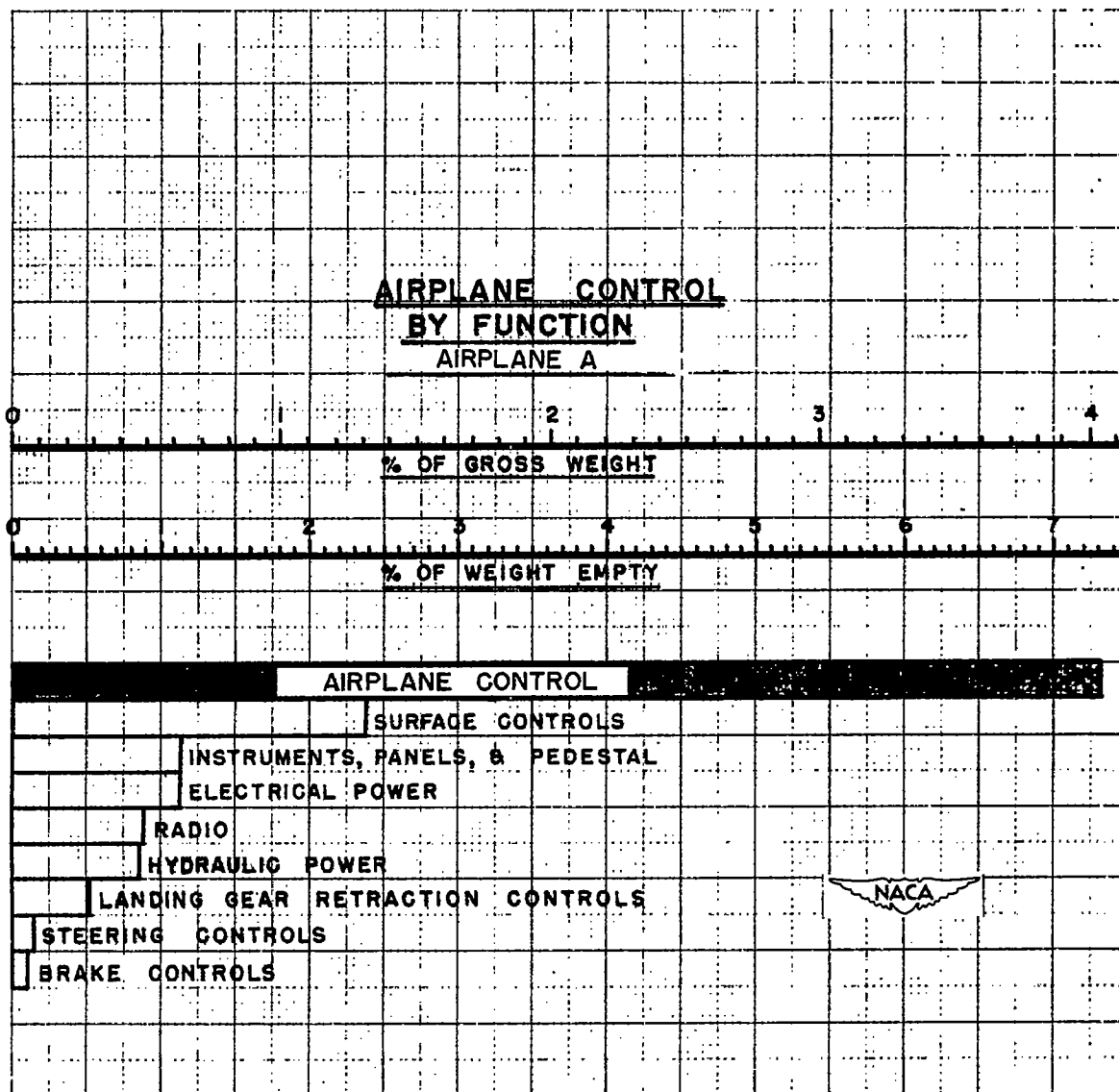


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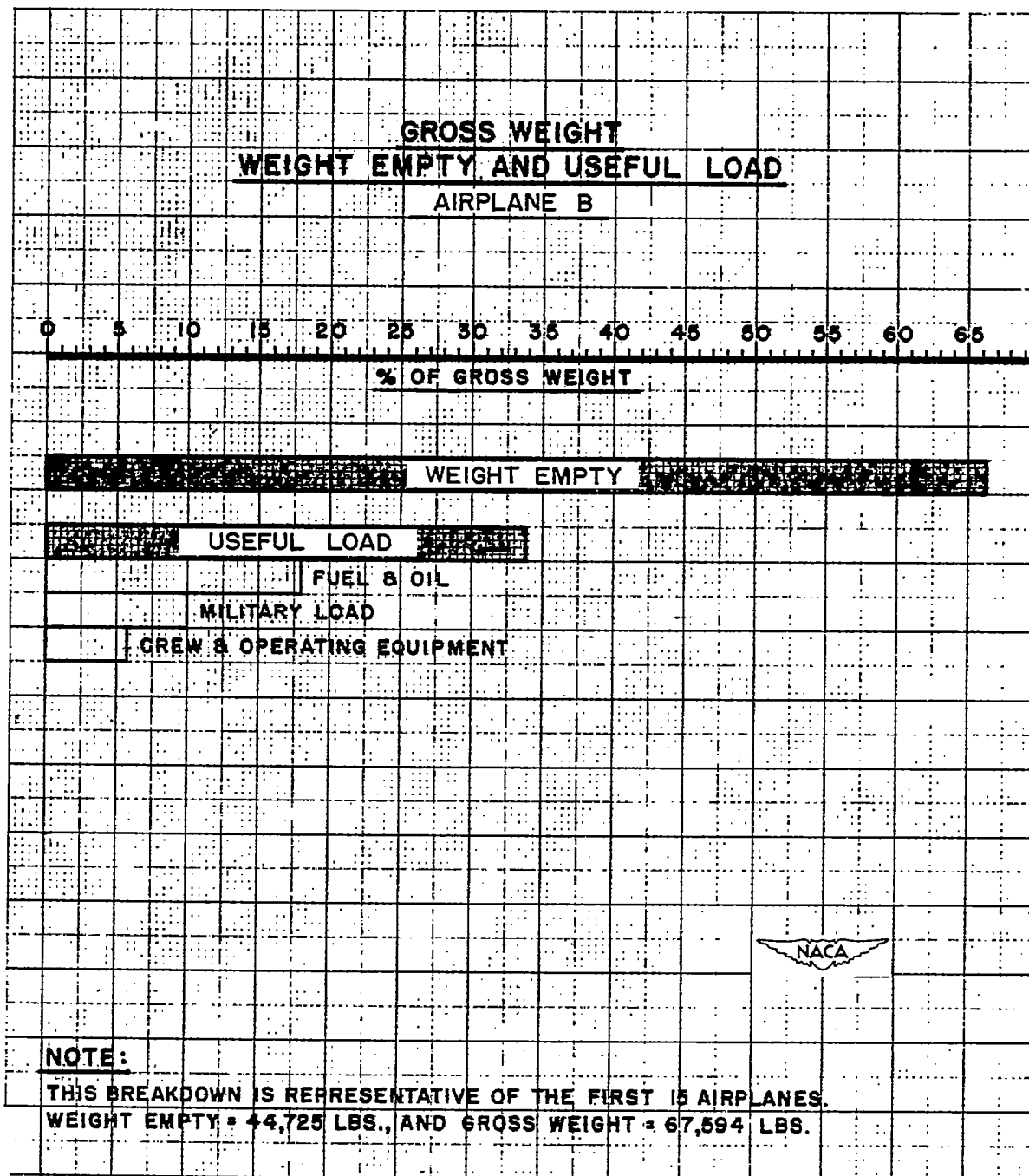
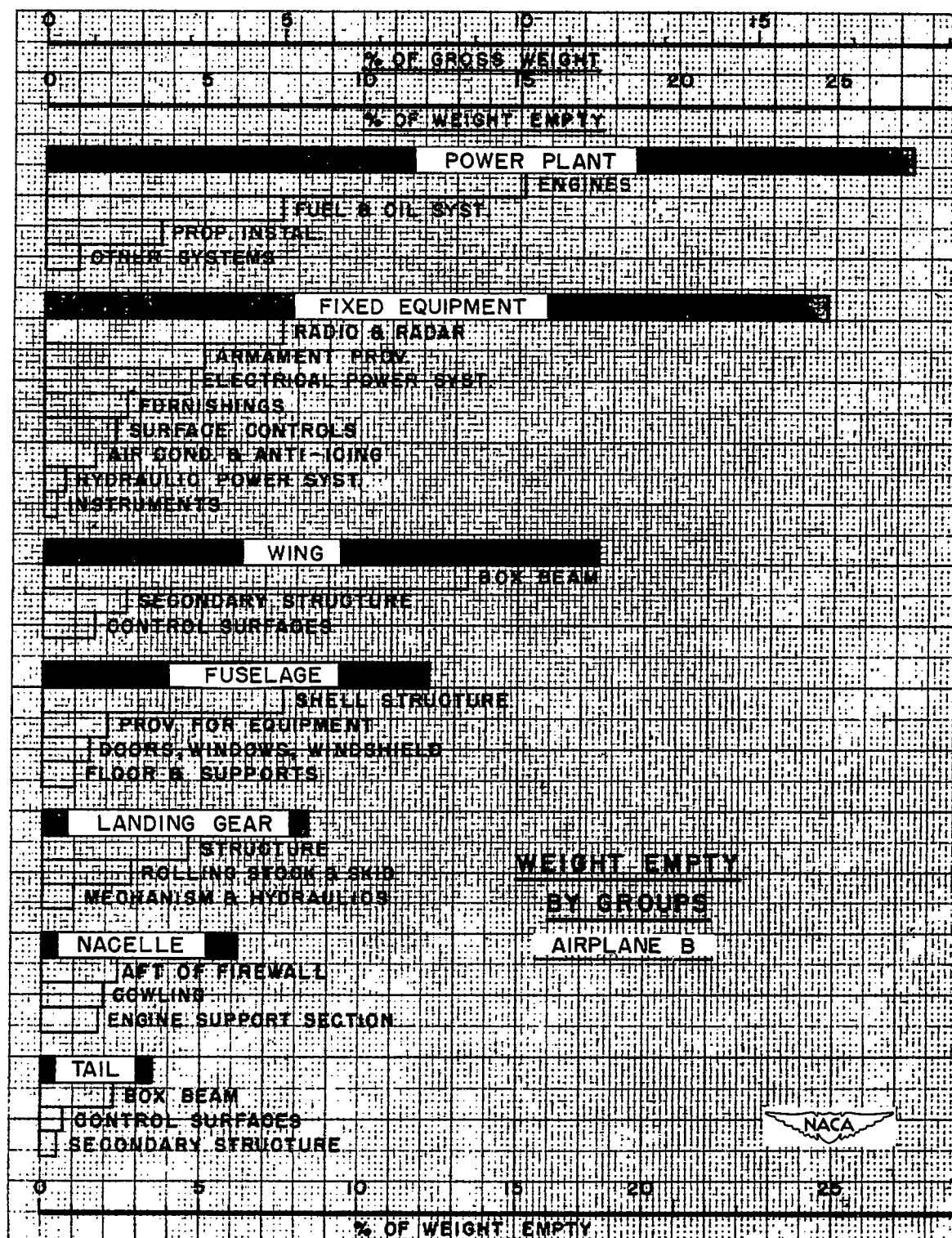
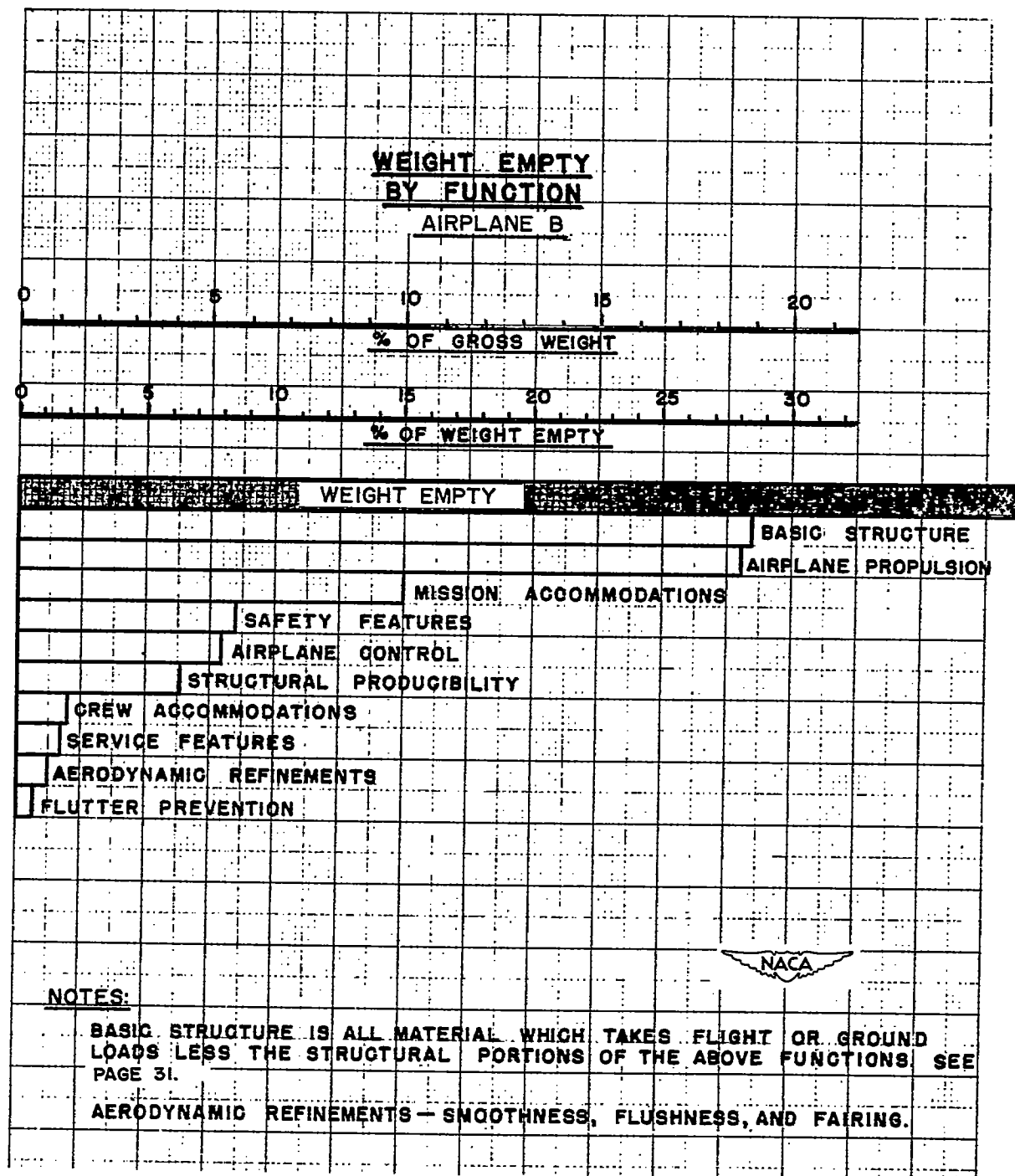


Chart B-2



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Chart B-4

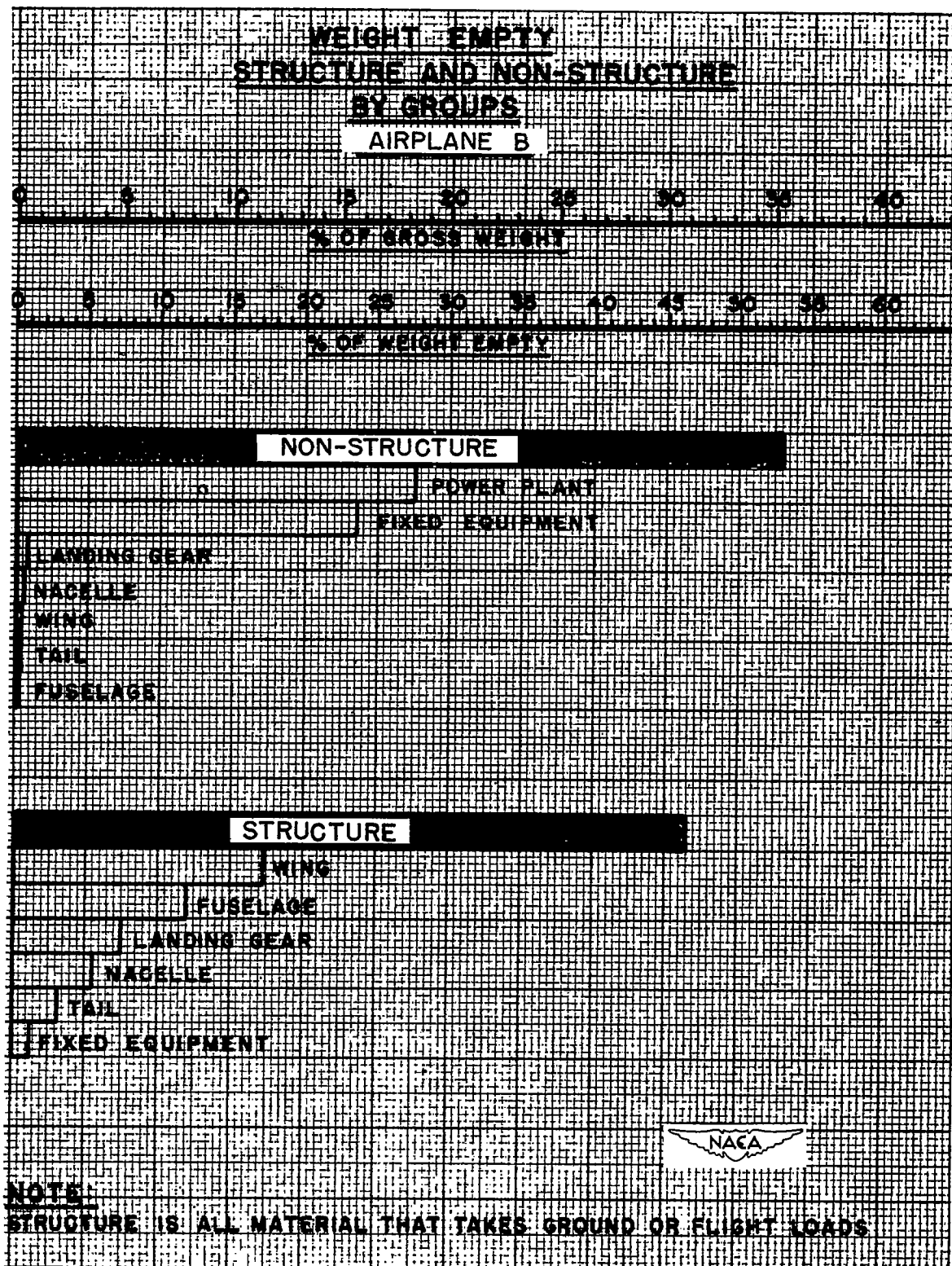
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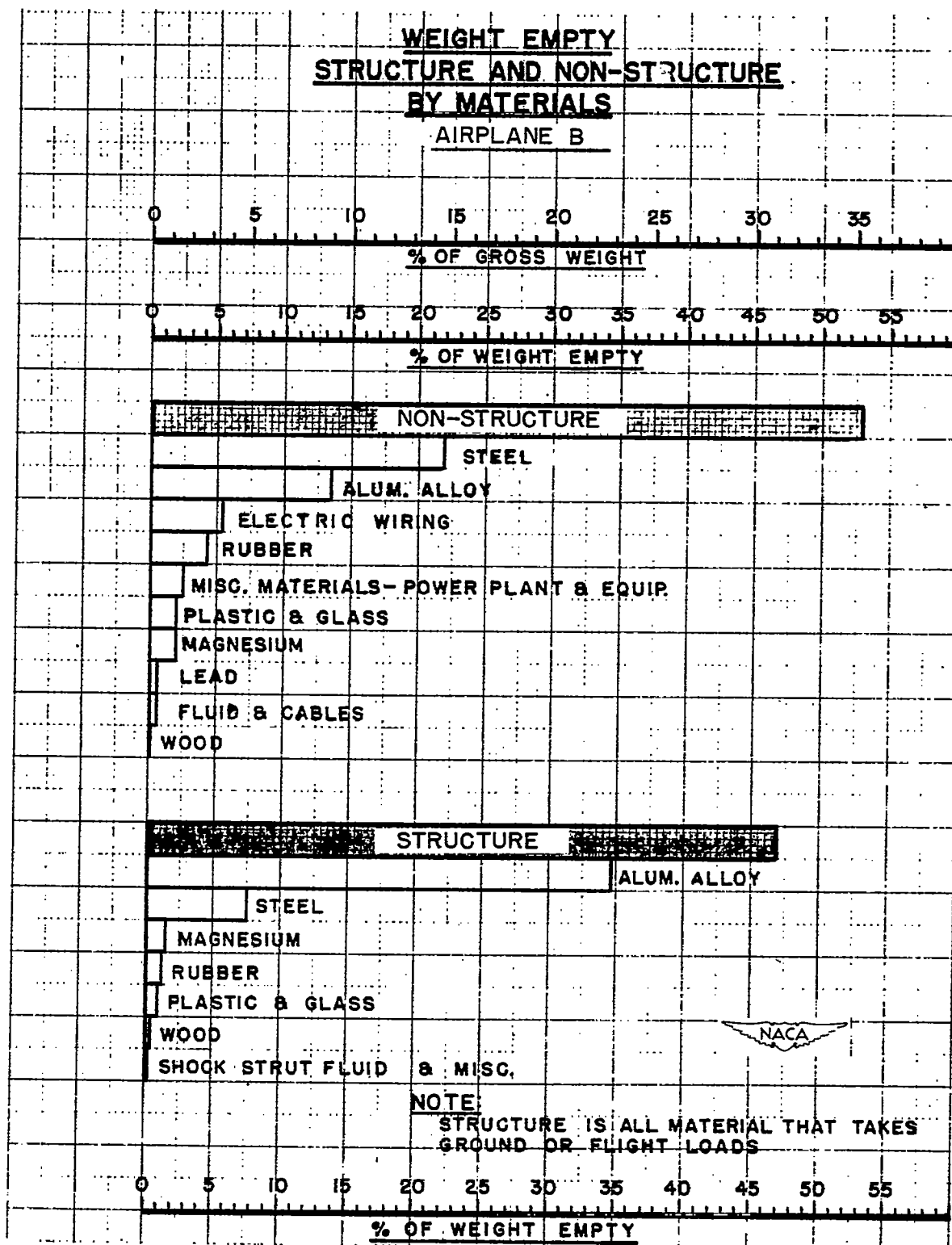


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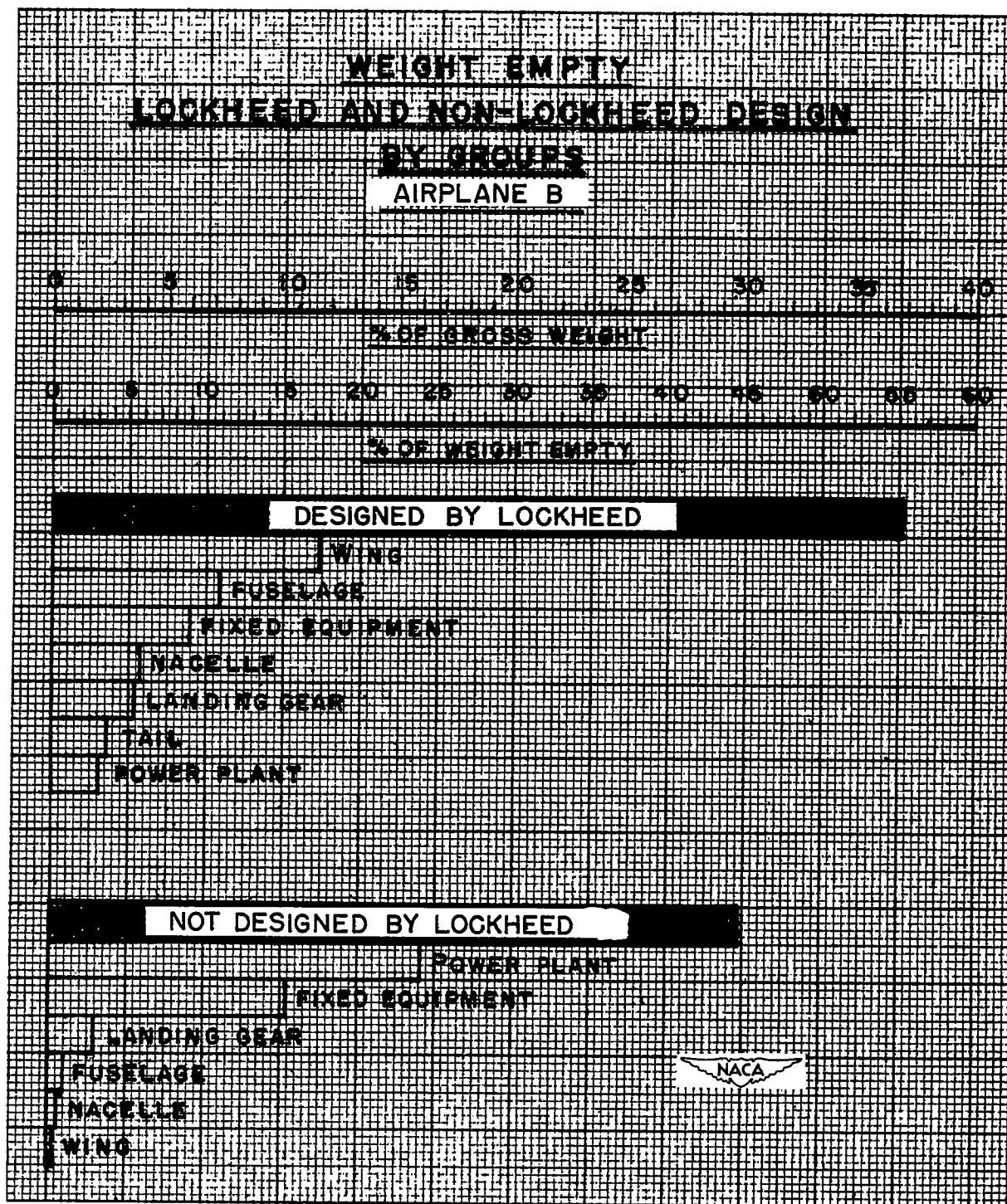


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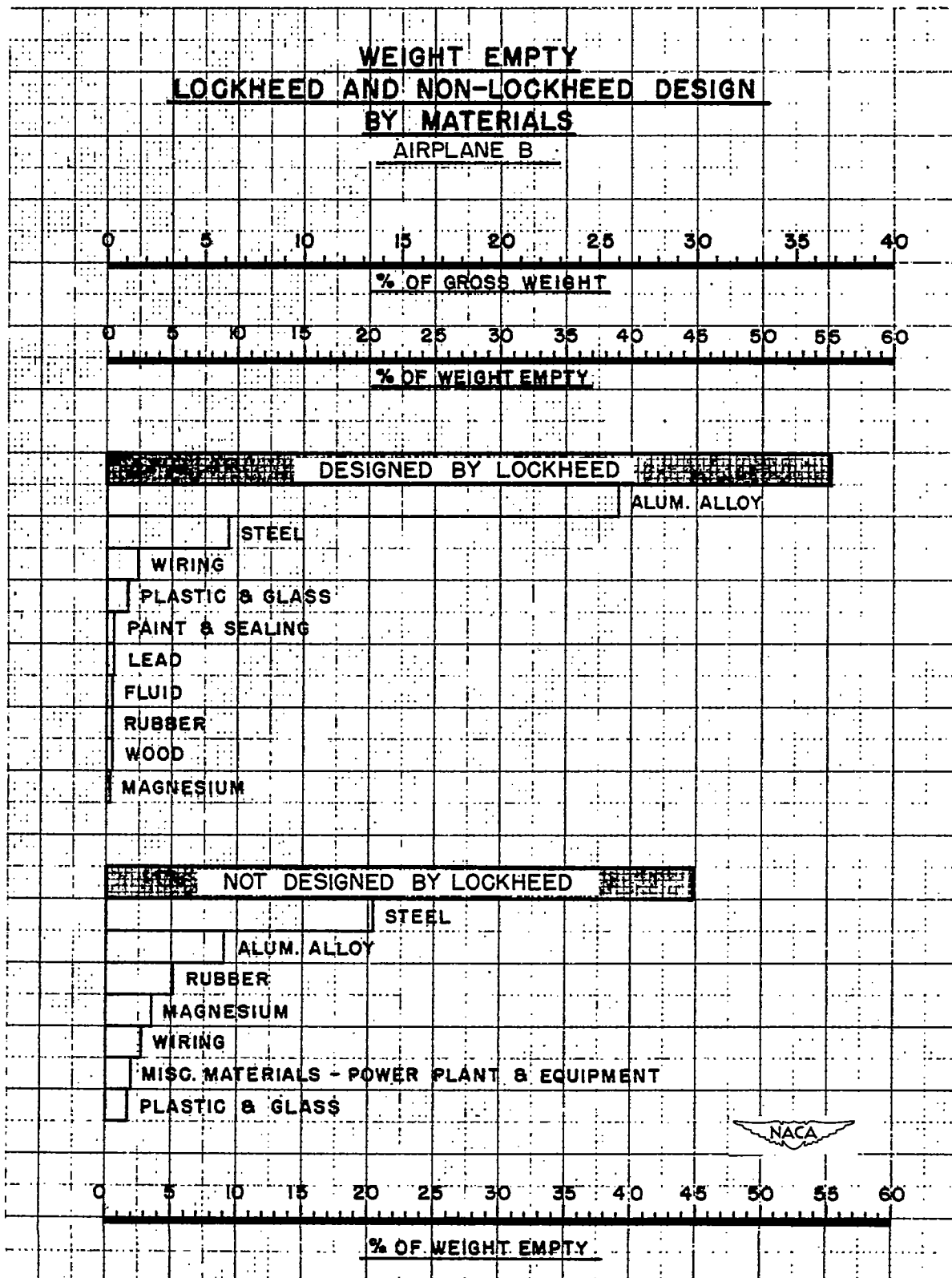


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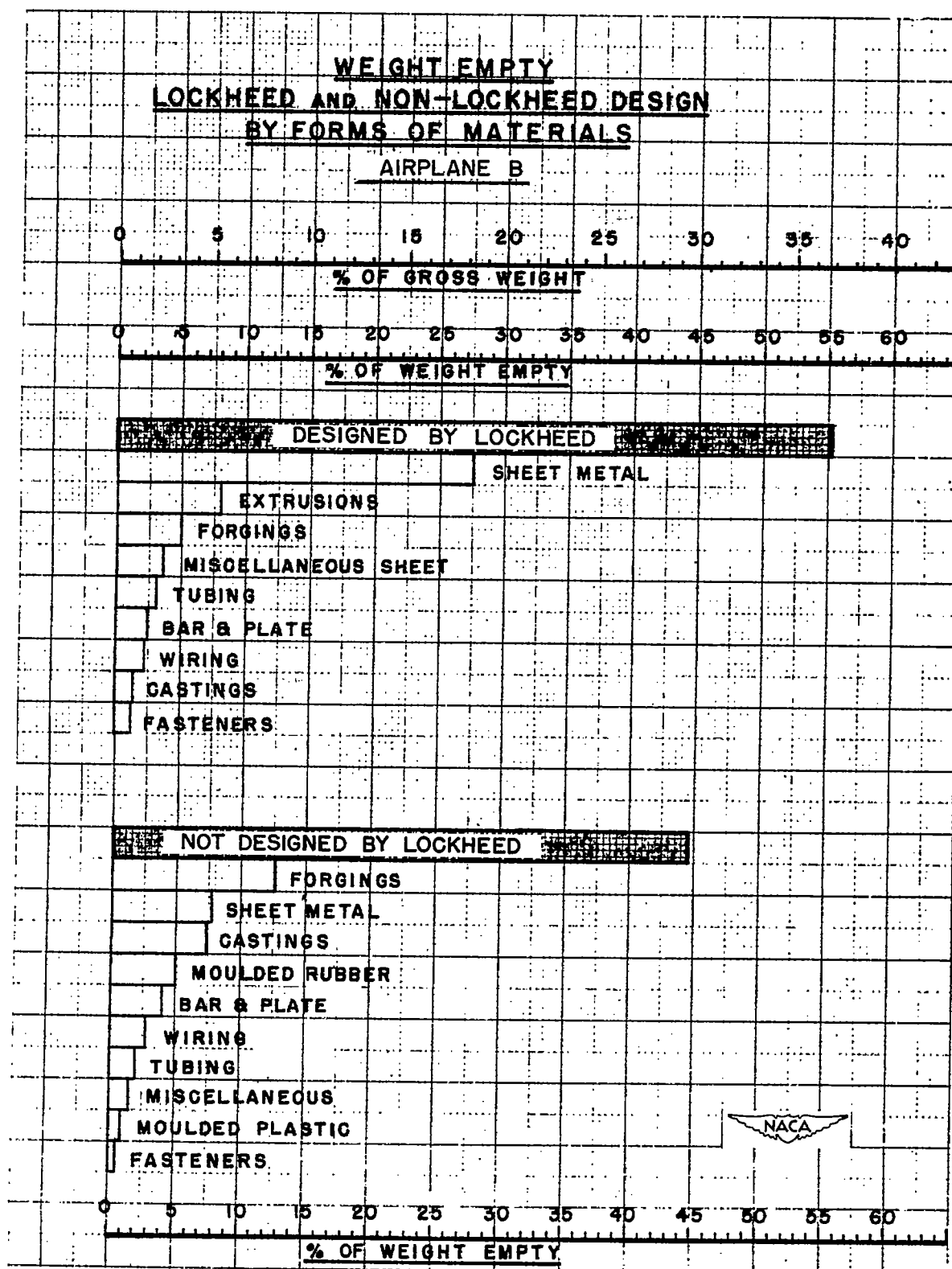


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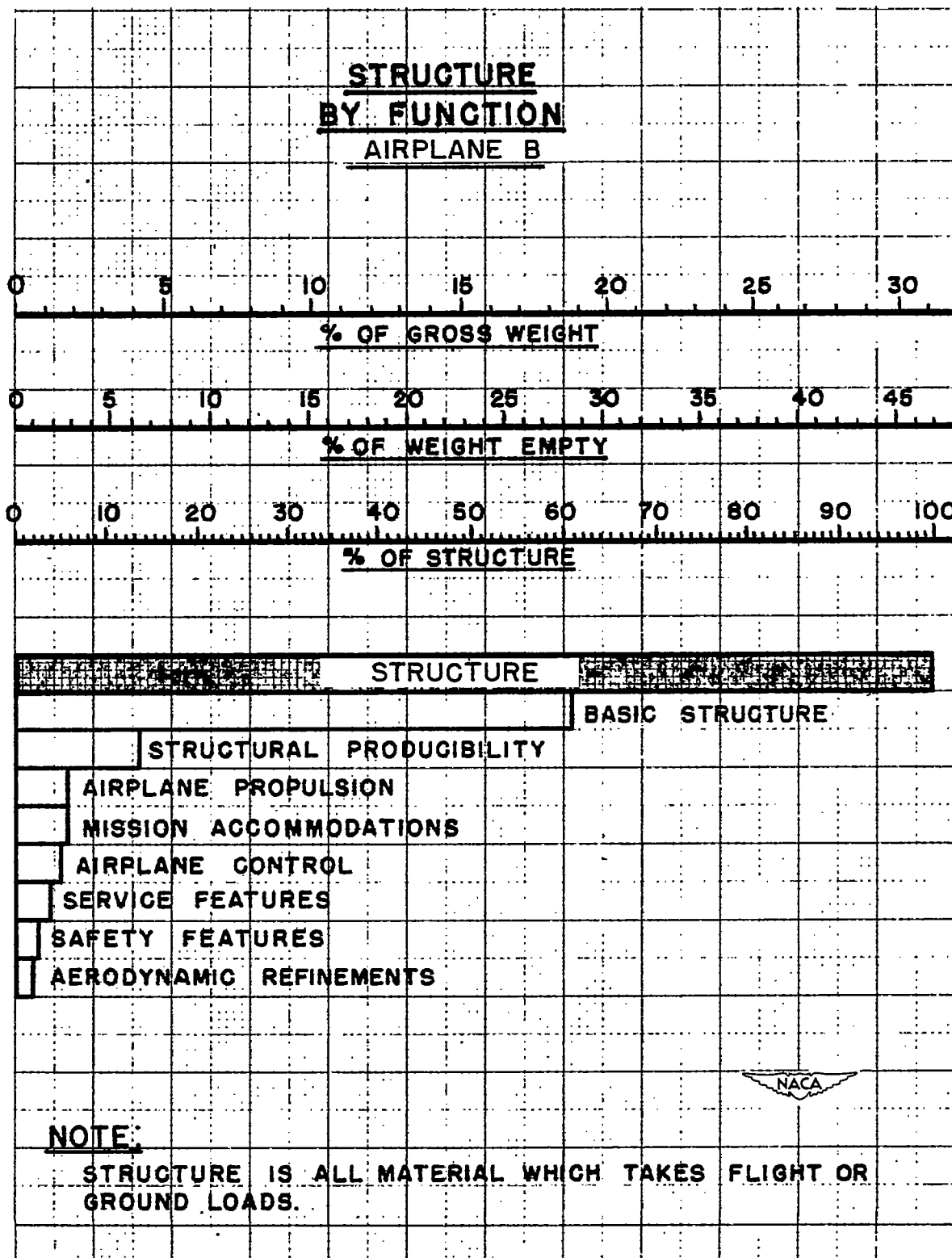
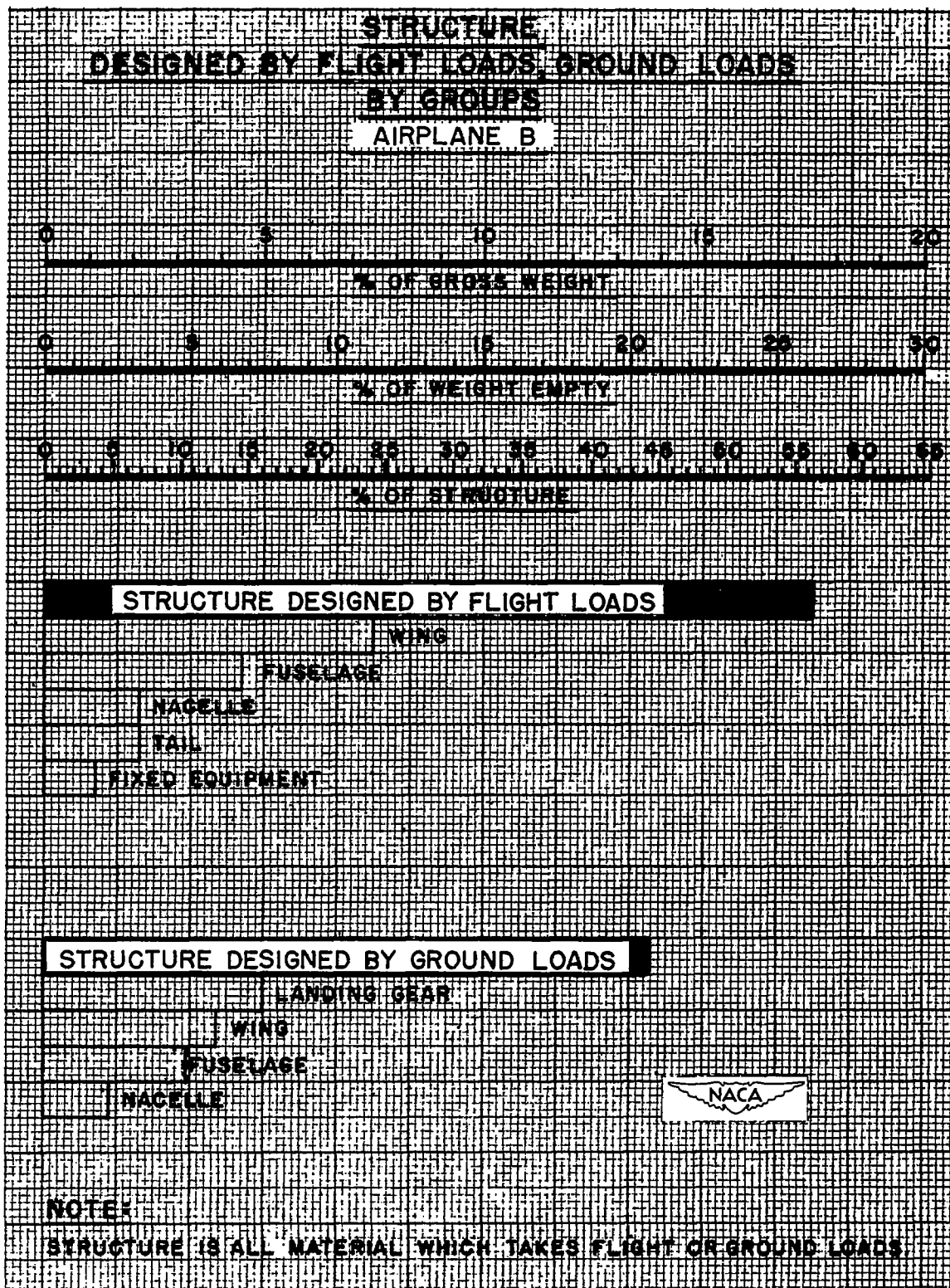
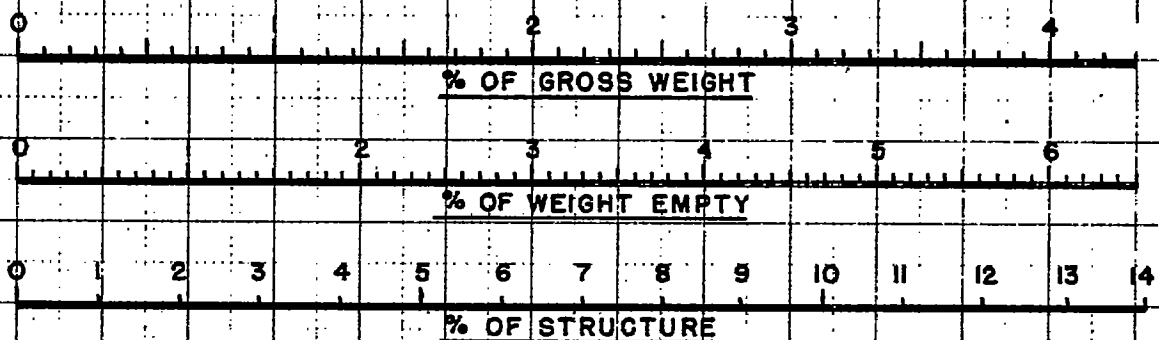


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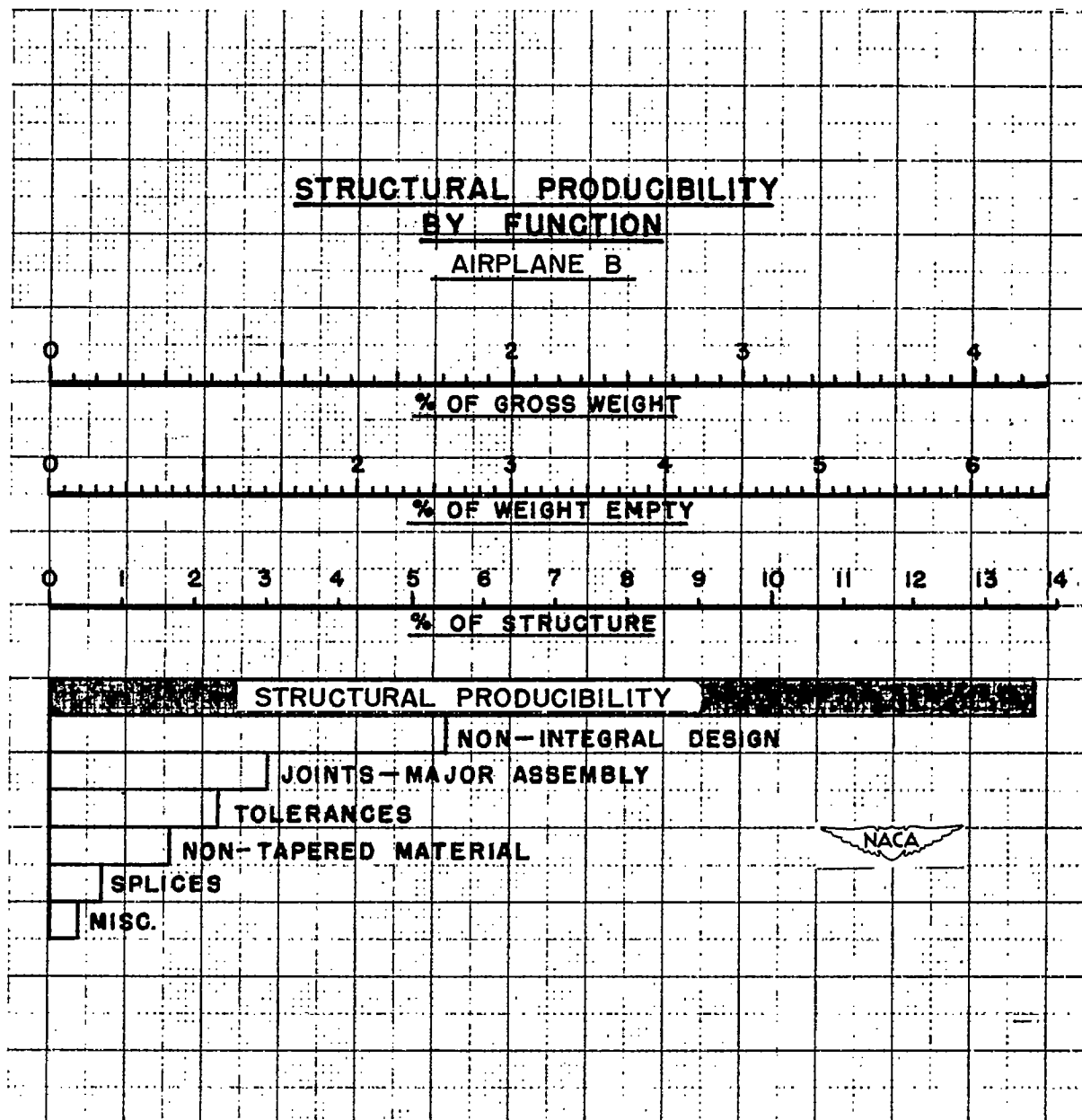
**STRUCTURAL PRODUCIBILITY
BY GROUPS
AIRPLANE B**



STRUCTURAL PRODUCIBILITY	
	WING
	FUSELAGE
TAIL	
NACELLE	
LANDING GEAR	



Chart B-12



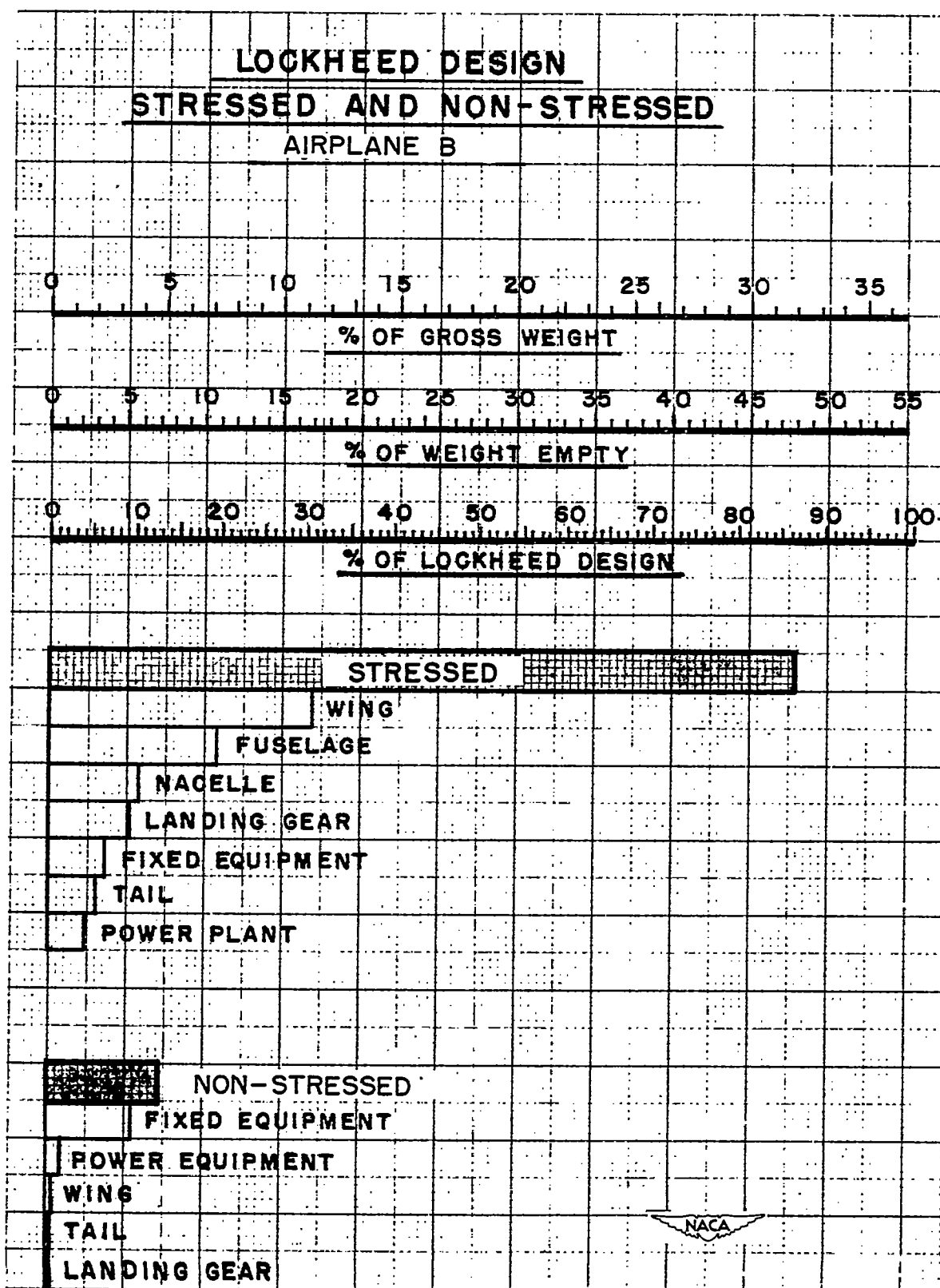
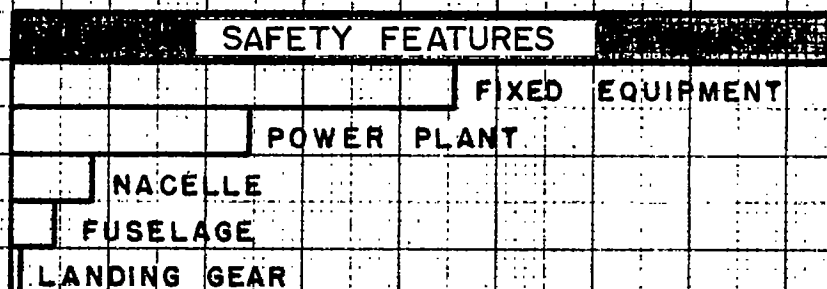
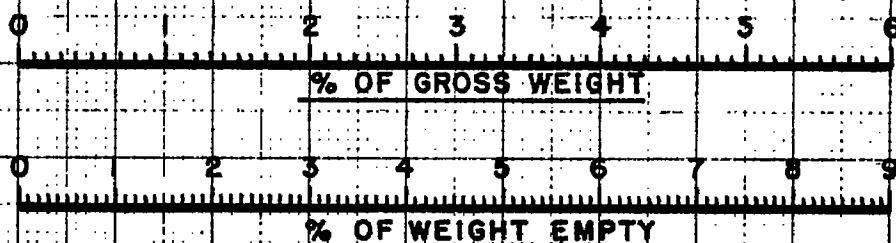


Chart B-14

SAFETY FEATURES
BY GROUPS
AIRPLANE B

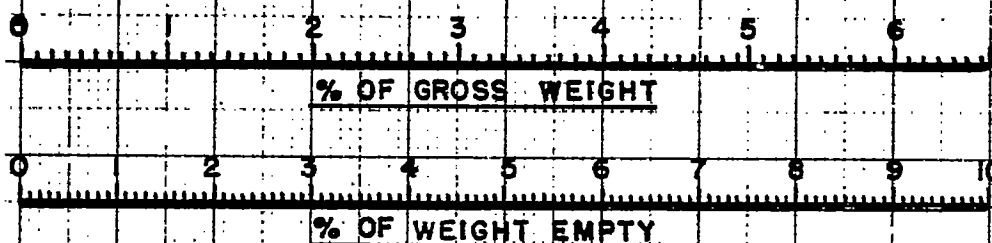


NOTE:

DOES NOT INCLUDE ITEMS IN OPERATING EQUIPMENT
AMOUNTING TO 1.6% OF WEIGHT EMPTY OF WHICH 0.6%
IS FOR CRASH PROTECTION.



SAFETY FEATURES
BY FUNCTION
AIRPLANE B



SAFETY FEATURES

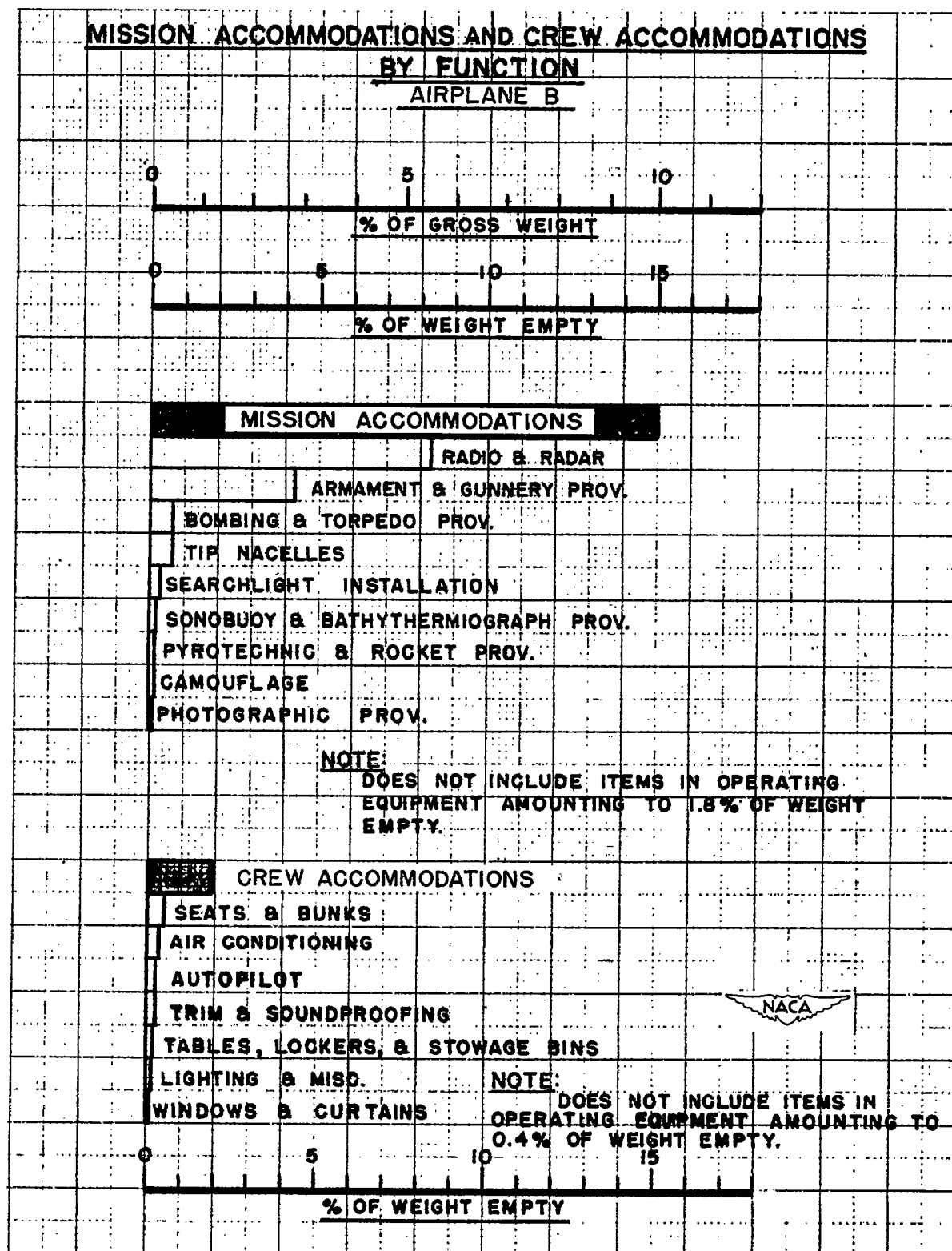
- ☐ BULLET SEALING TANKS
- ☐ FIRE PROTECTION
- ☐ GUNFIRE PROTECTION
- ☐ ANTI-ICING
- ☐ EMERG. FUNCTIONAL PROVISIONS
- ☐ CRASH PROTECTION
- ☐ MISCELLANEOUS

NACA

NOTE

DOES NOT INCLUDE ITEMS IN OPERATING EQUIPMENT AMOUNTING TO 1.6% OF WEIGHT EMPTY OF WHICH 0.6% IS FOR CRASH PROTECTION

Chart B-16



SERVICE FEATURES
BY GROUPS
AIRPLANE B

% OF GROSS WEIGHT

% OF WEIGHT EMPTY

SERVICE FEATURES

WING

NOSE

FUSELAGE

LANDING GEAR

TAIL

POWER PLANT

NACA

NOTE

DOES NOT INCLUDE PROVISIONS FOR SERVICE LIFE OTHER
THAN PROTECTIVE COATING.

Chart B-18

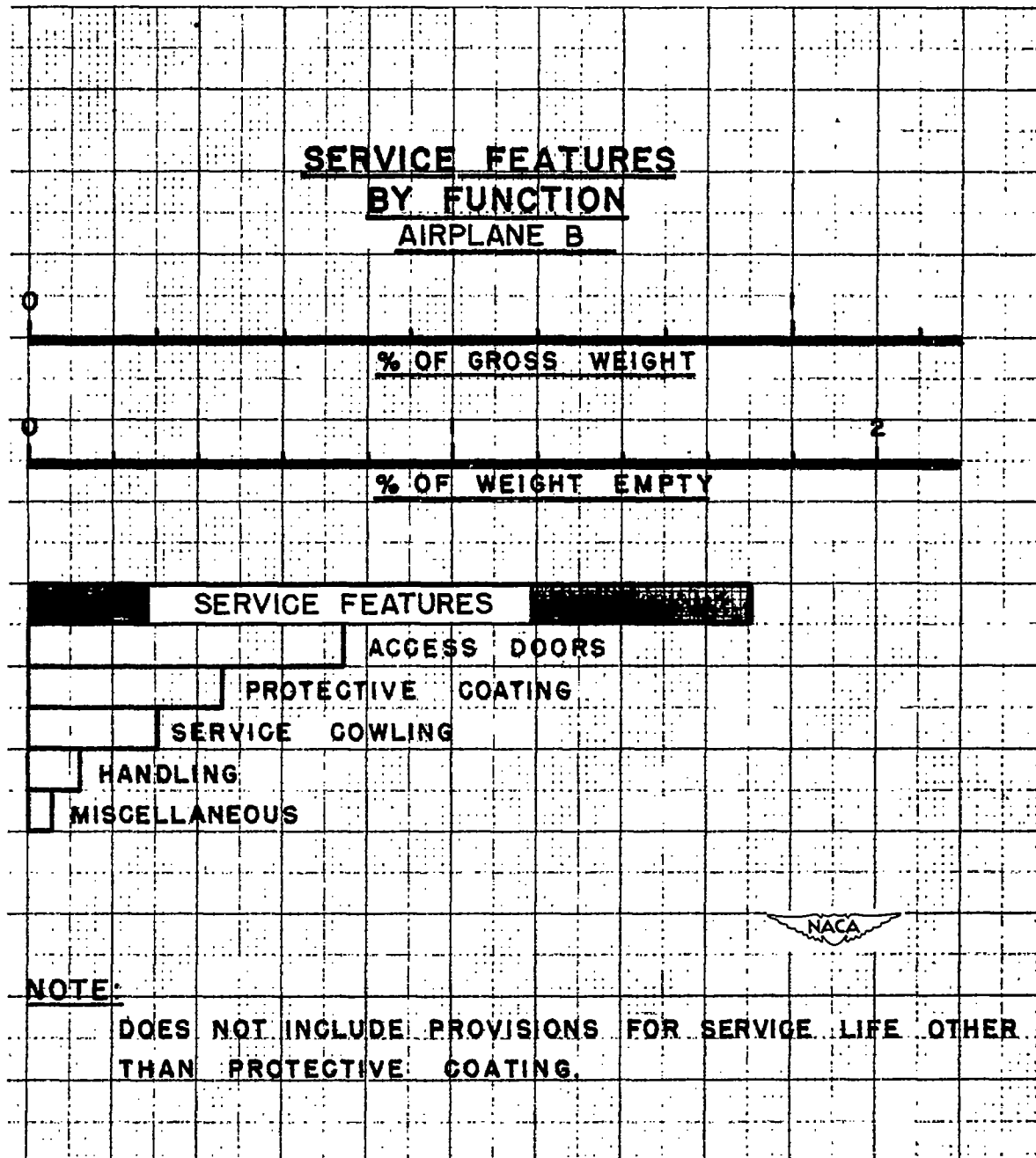


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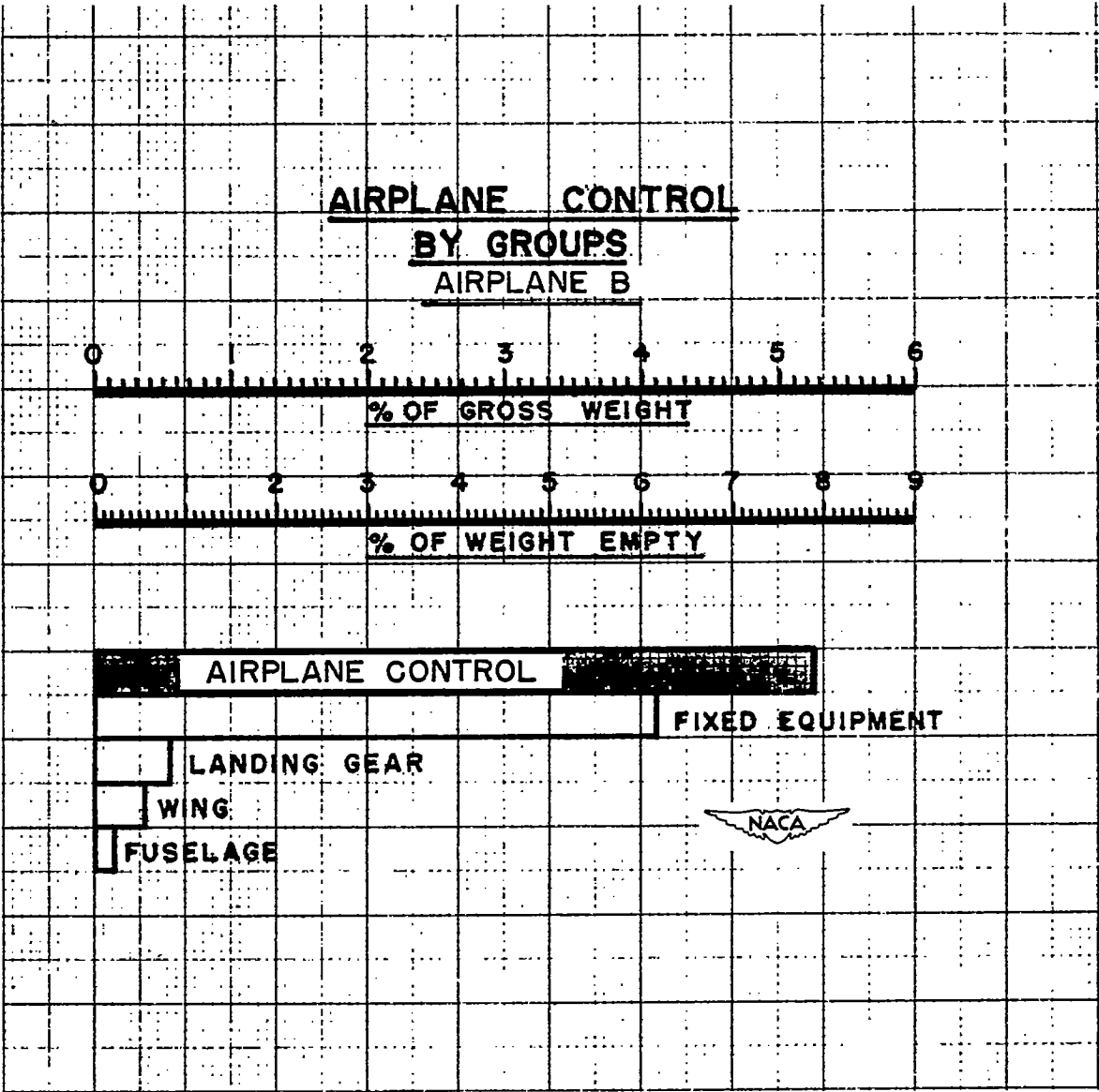
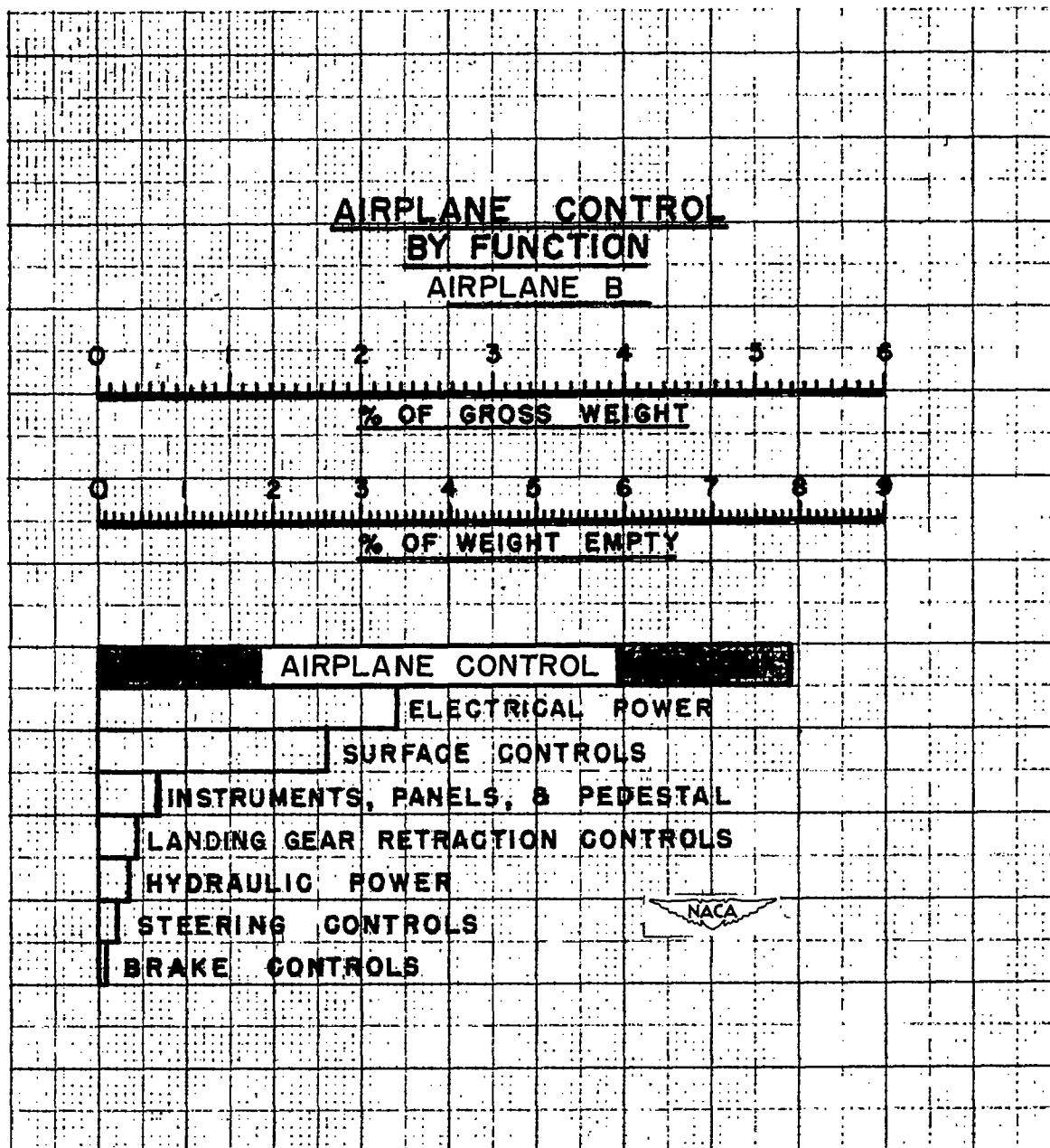


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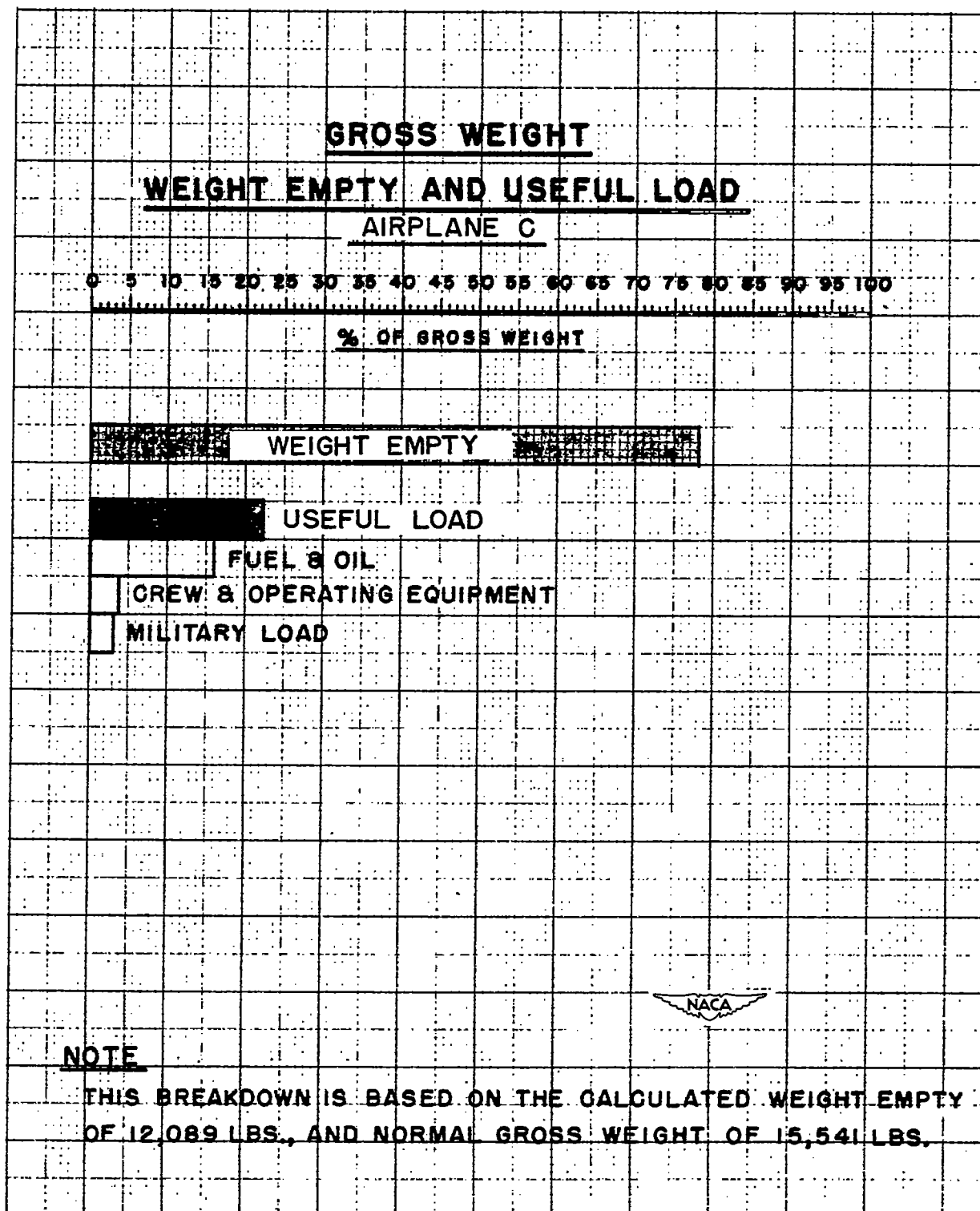


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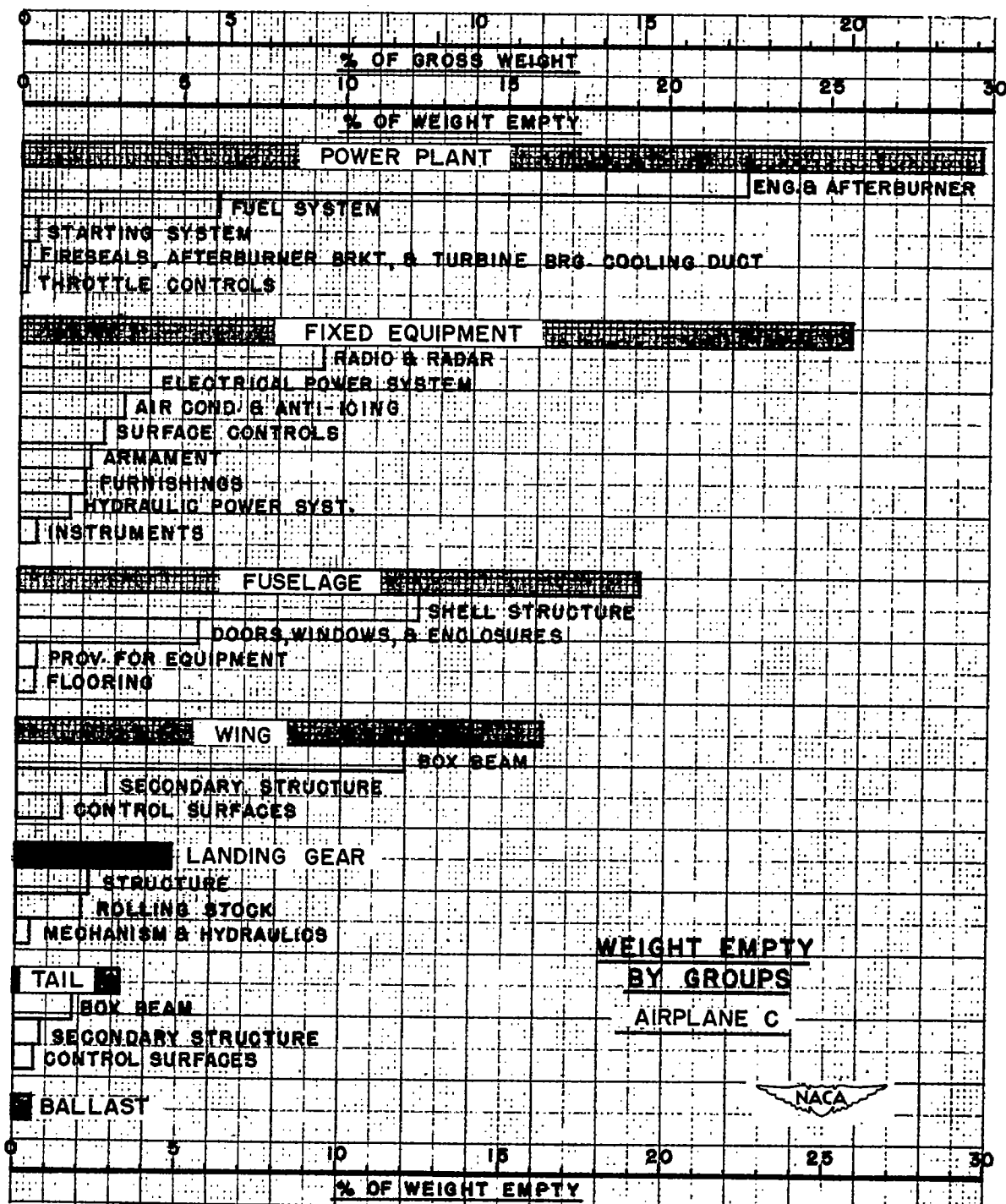


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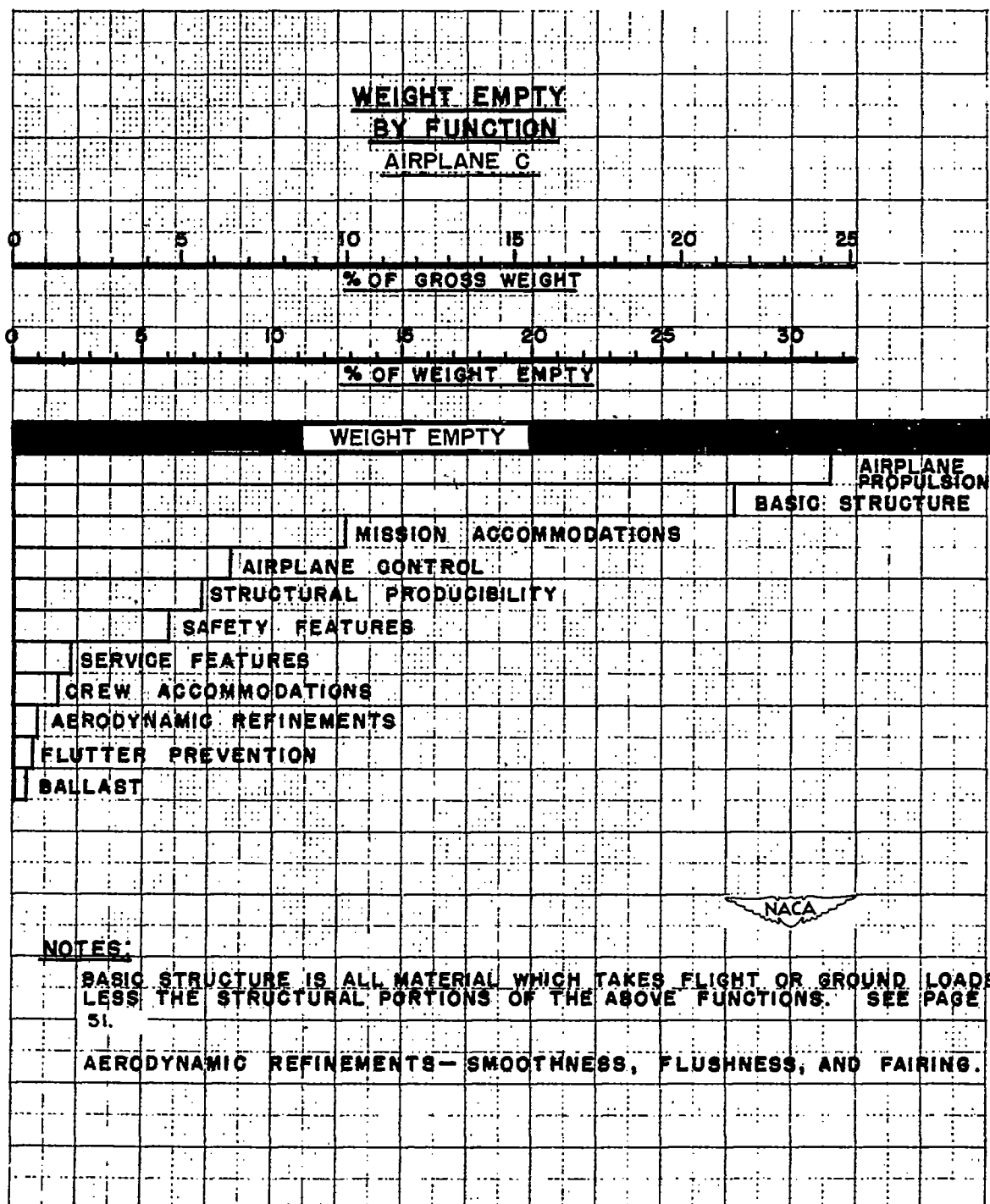
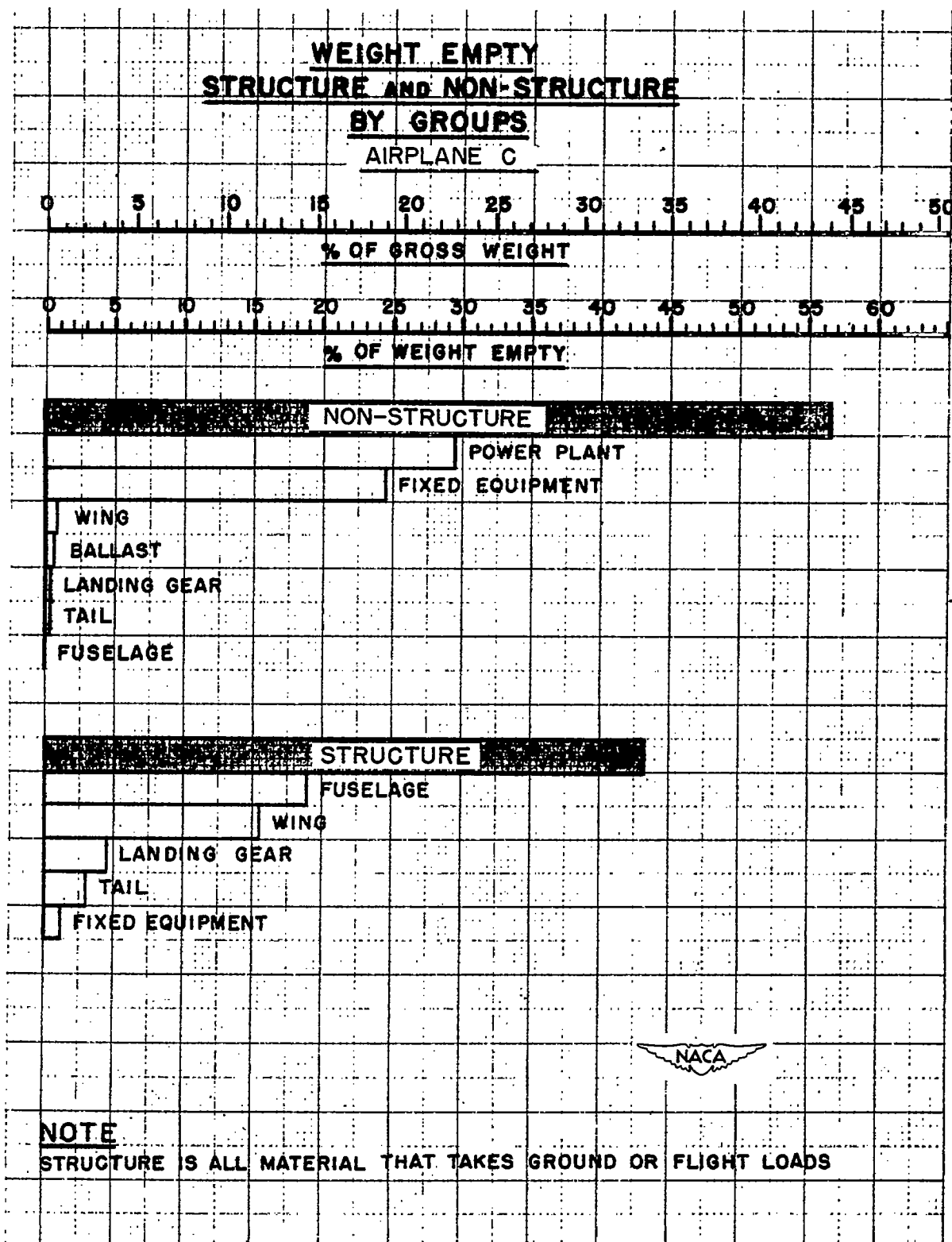


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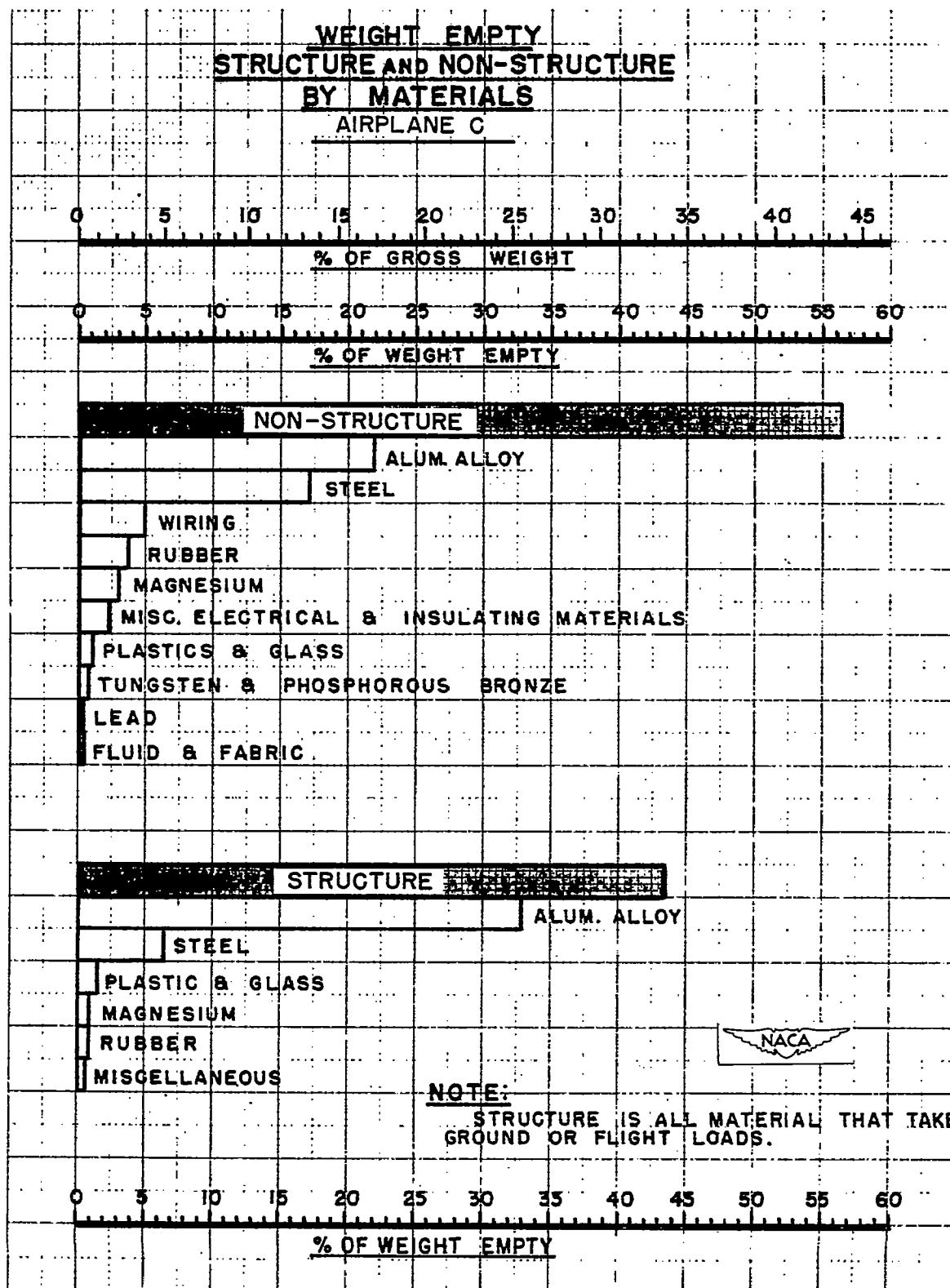
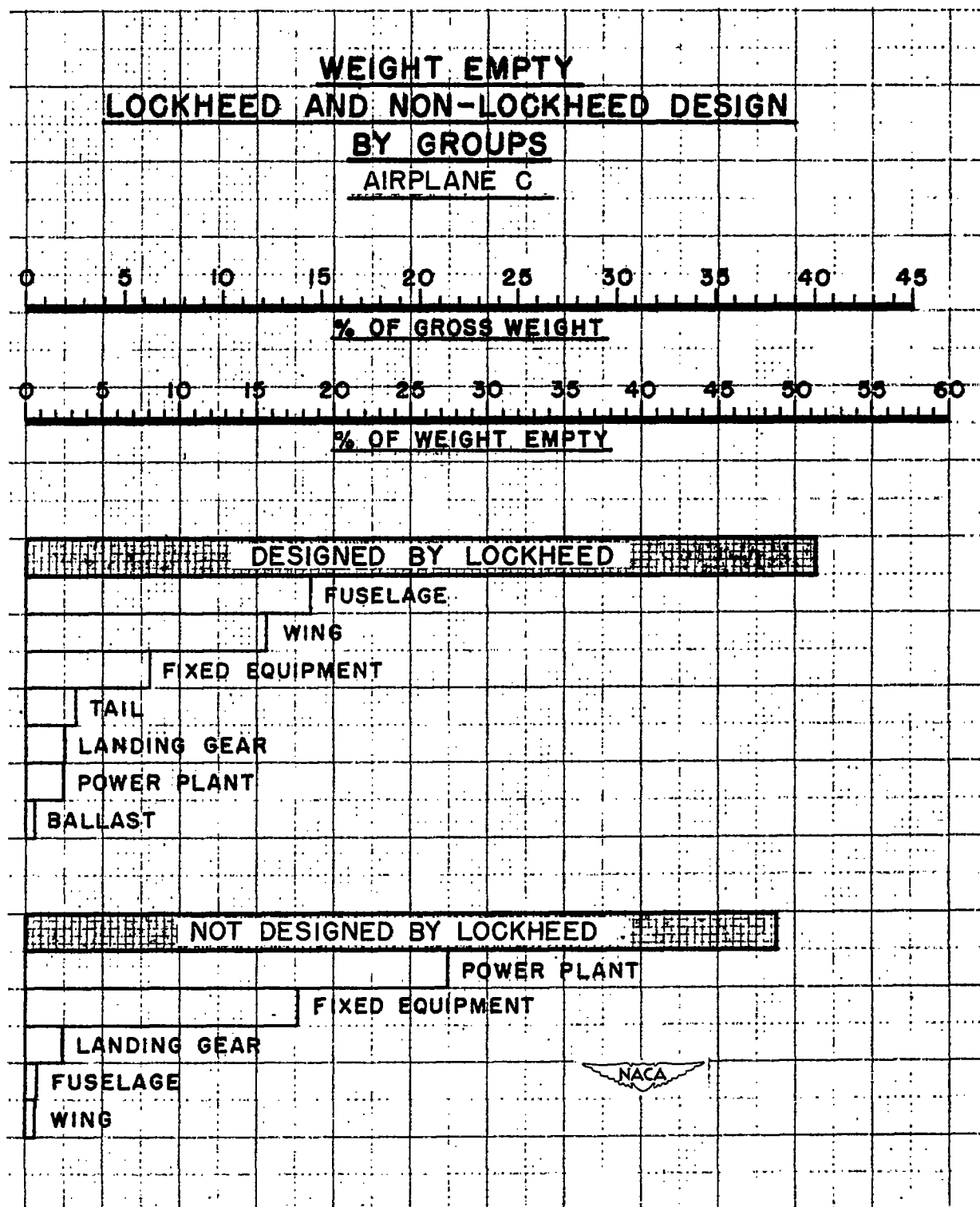


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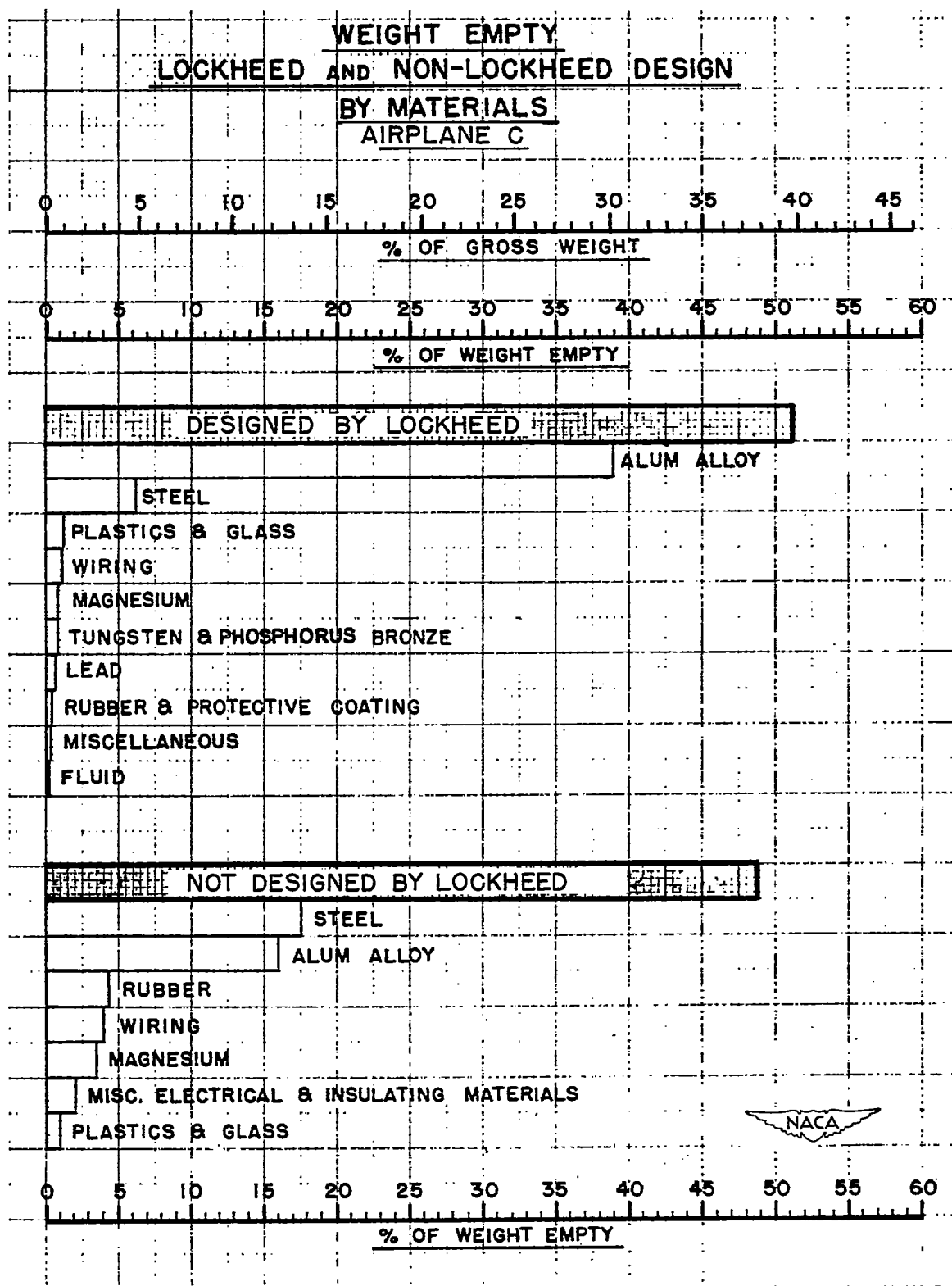
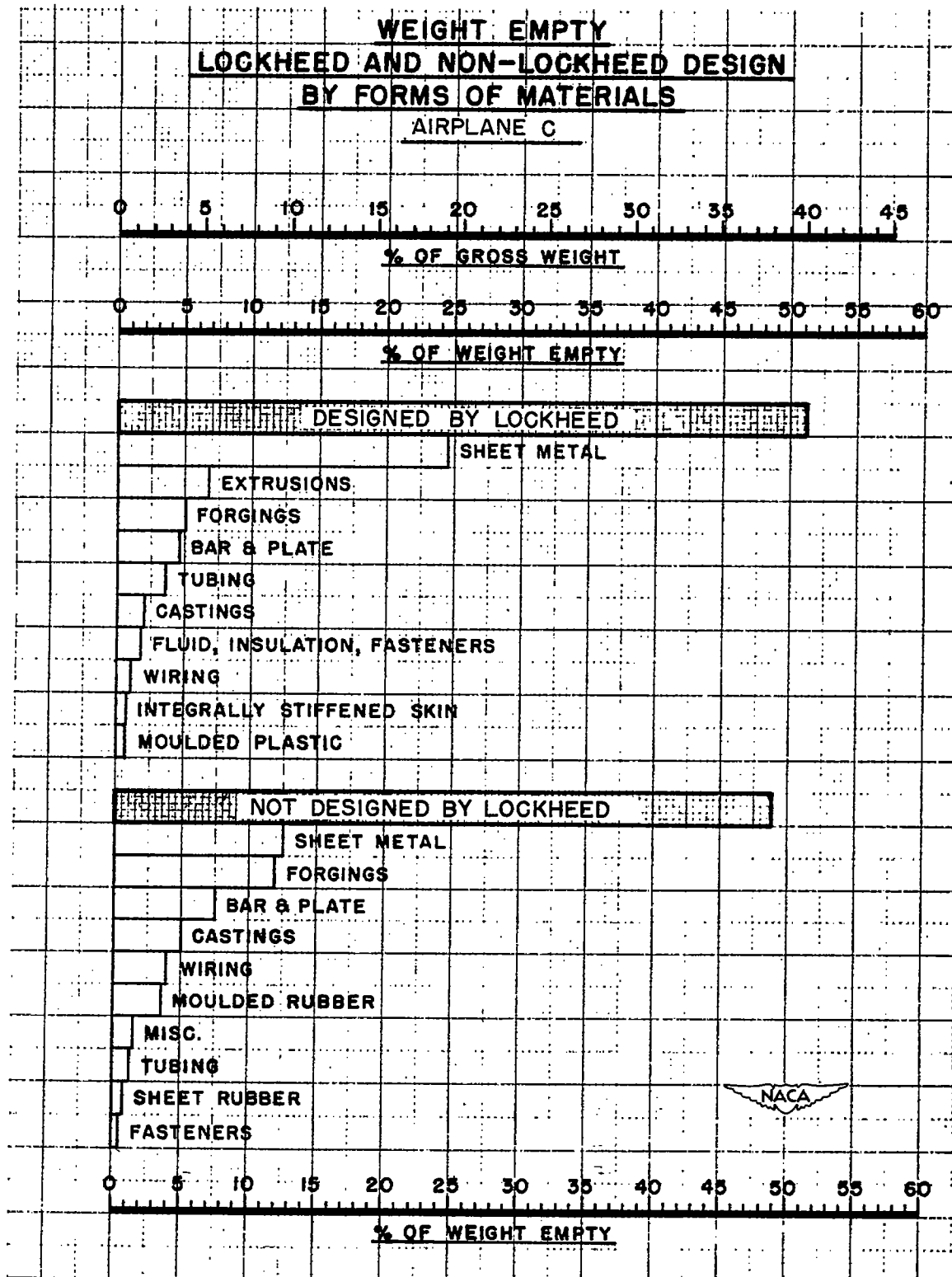


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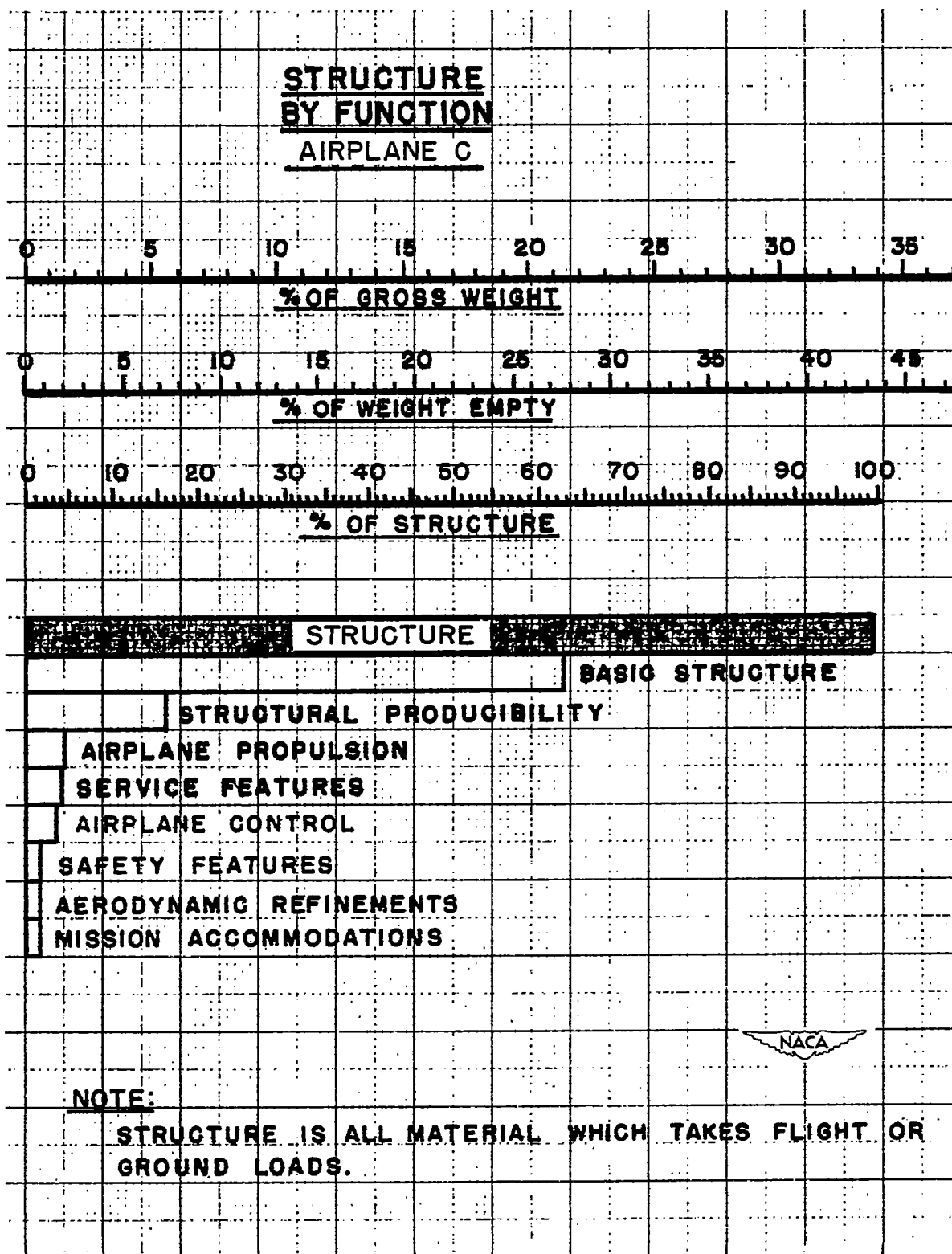
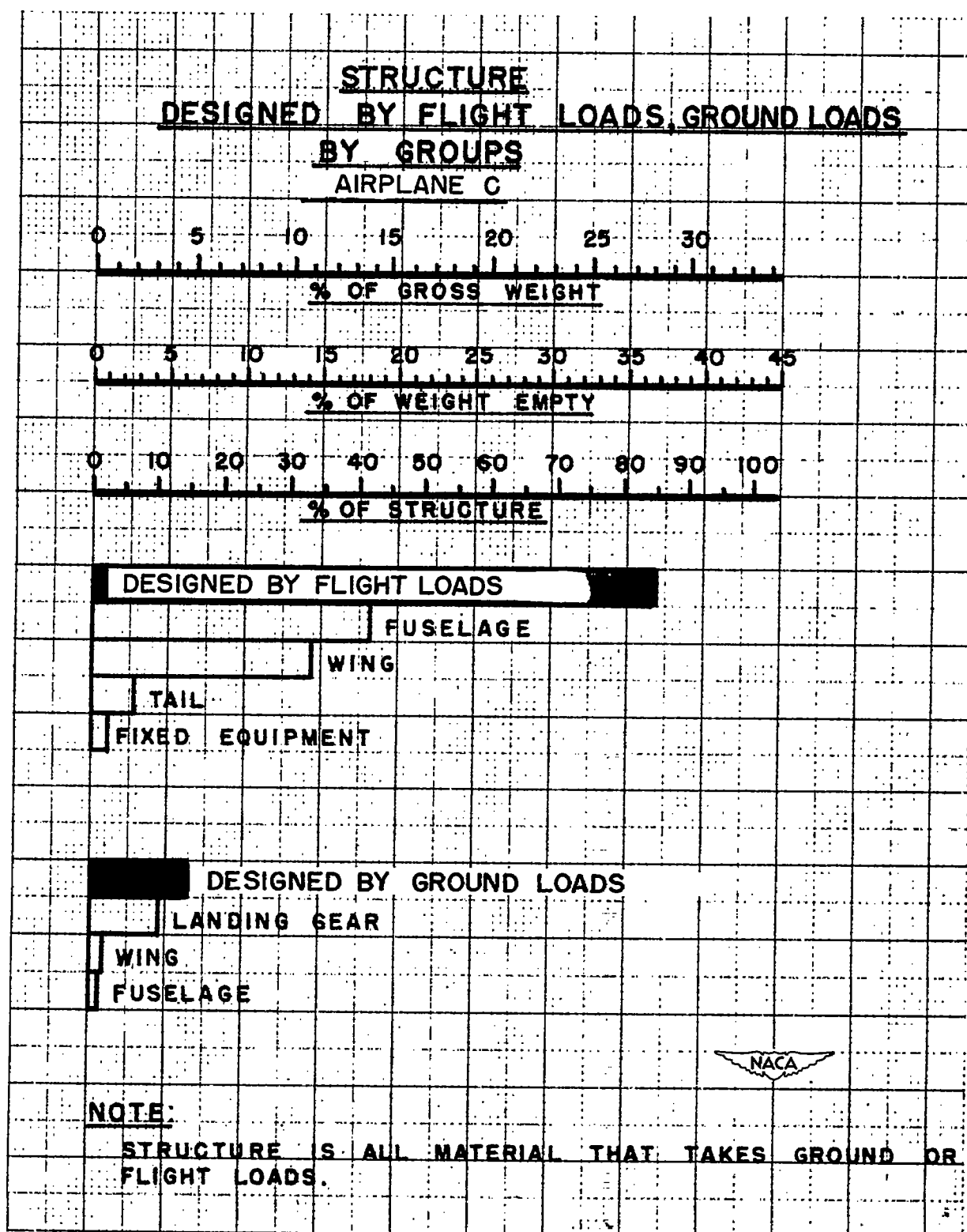


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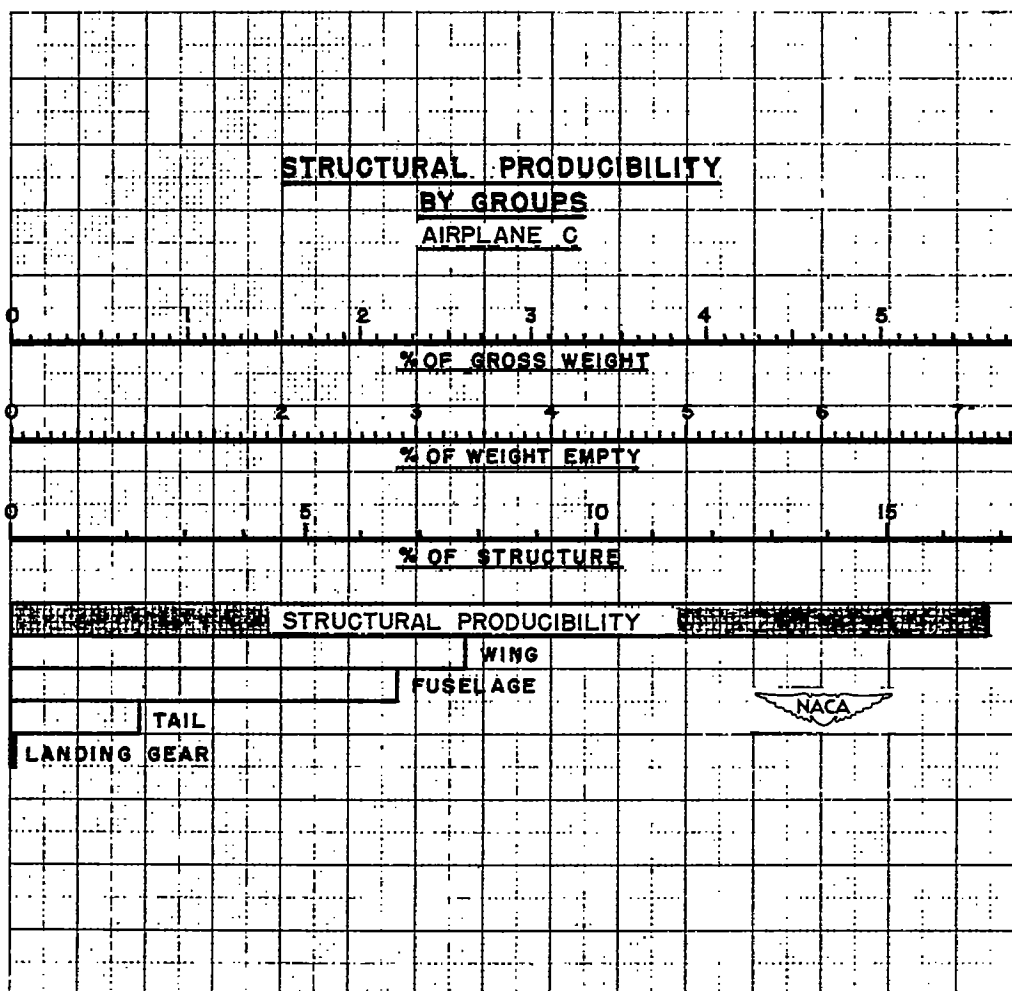
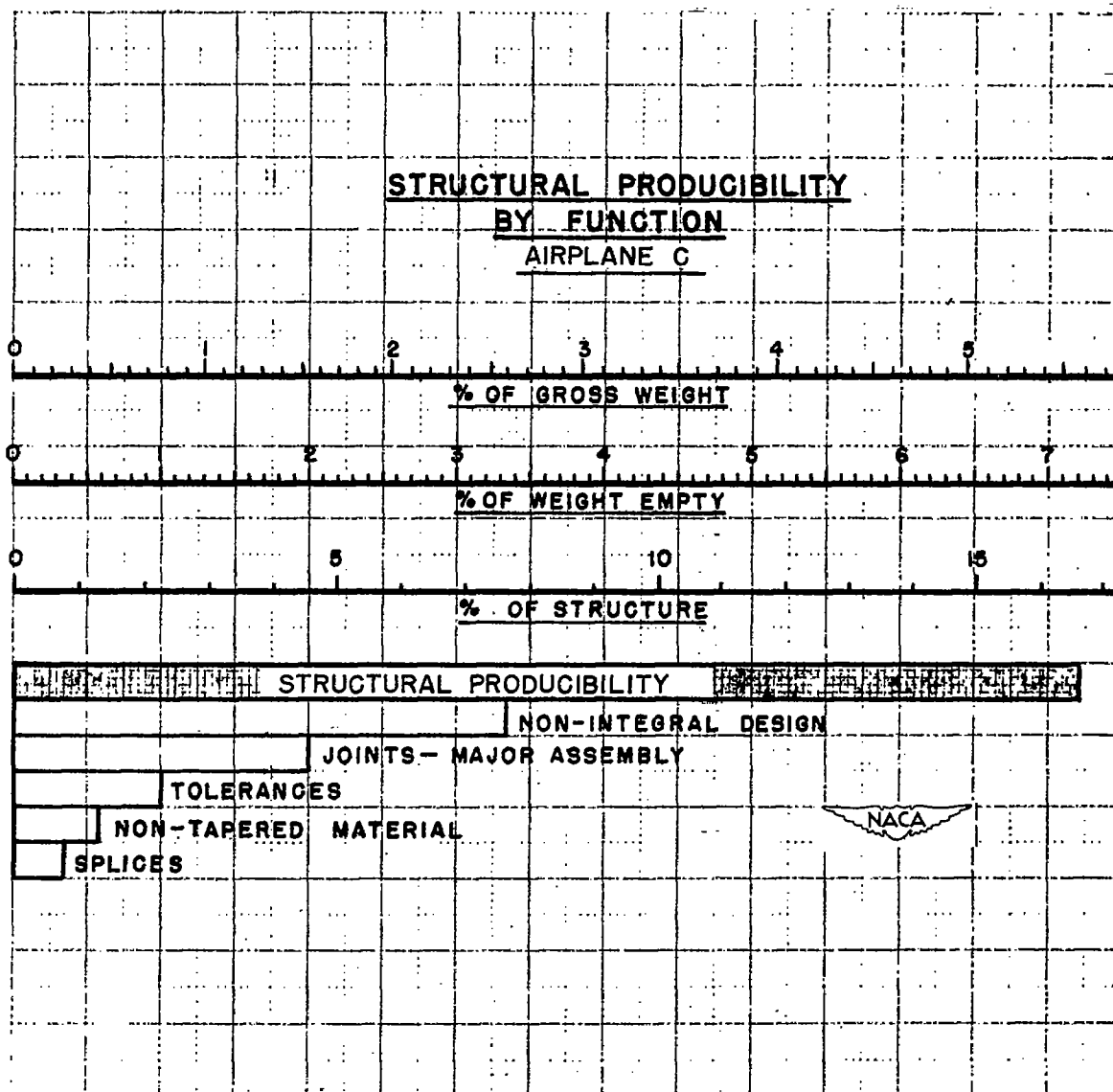


Chart C-12



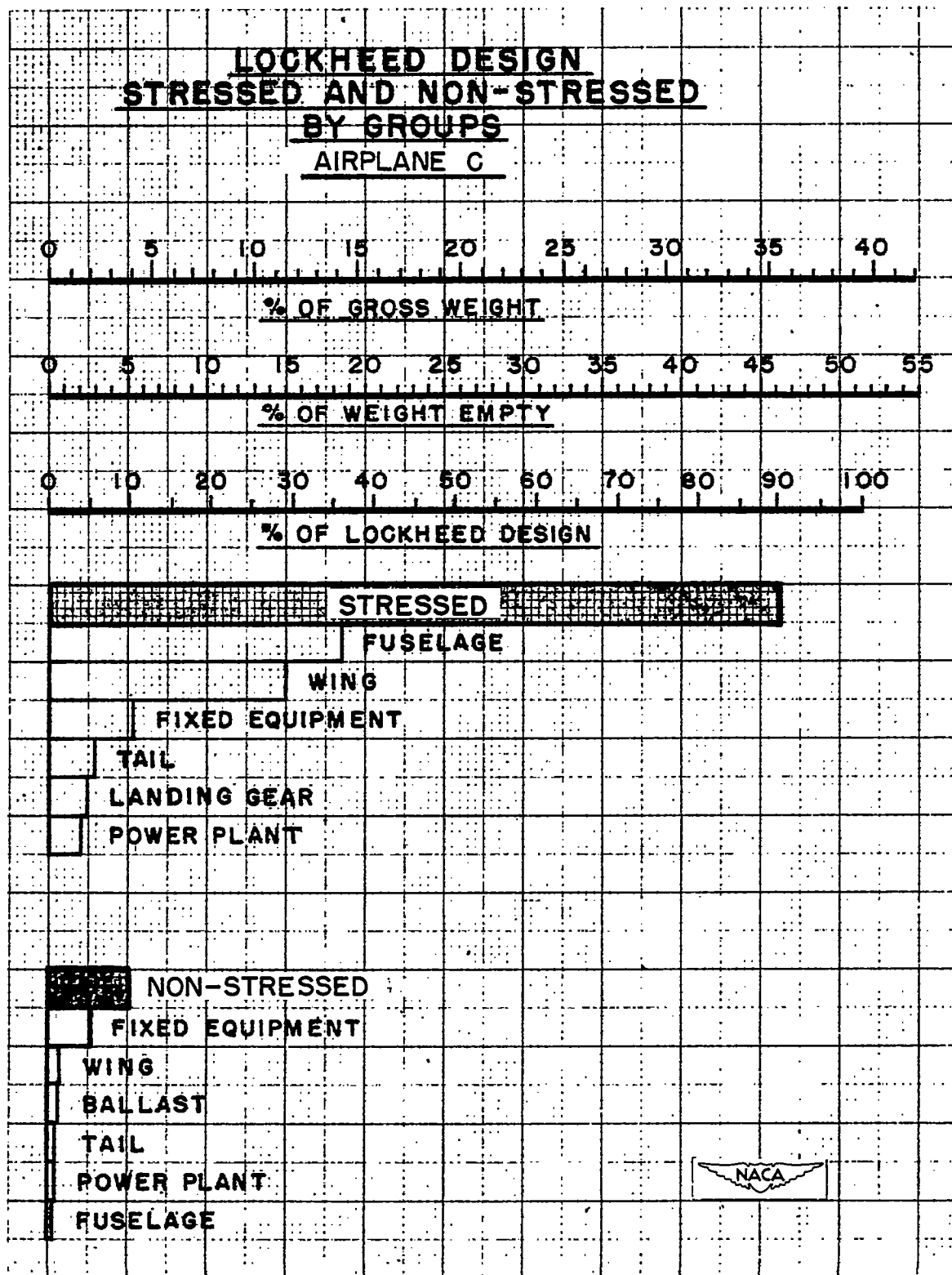
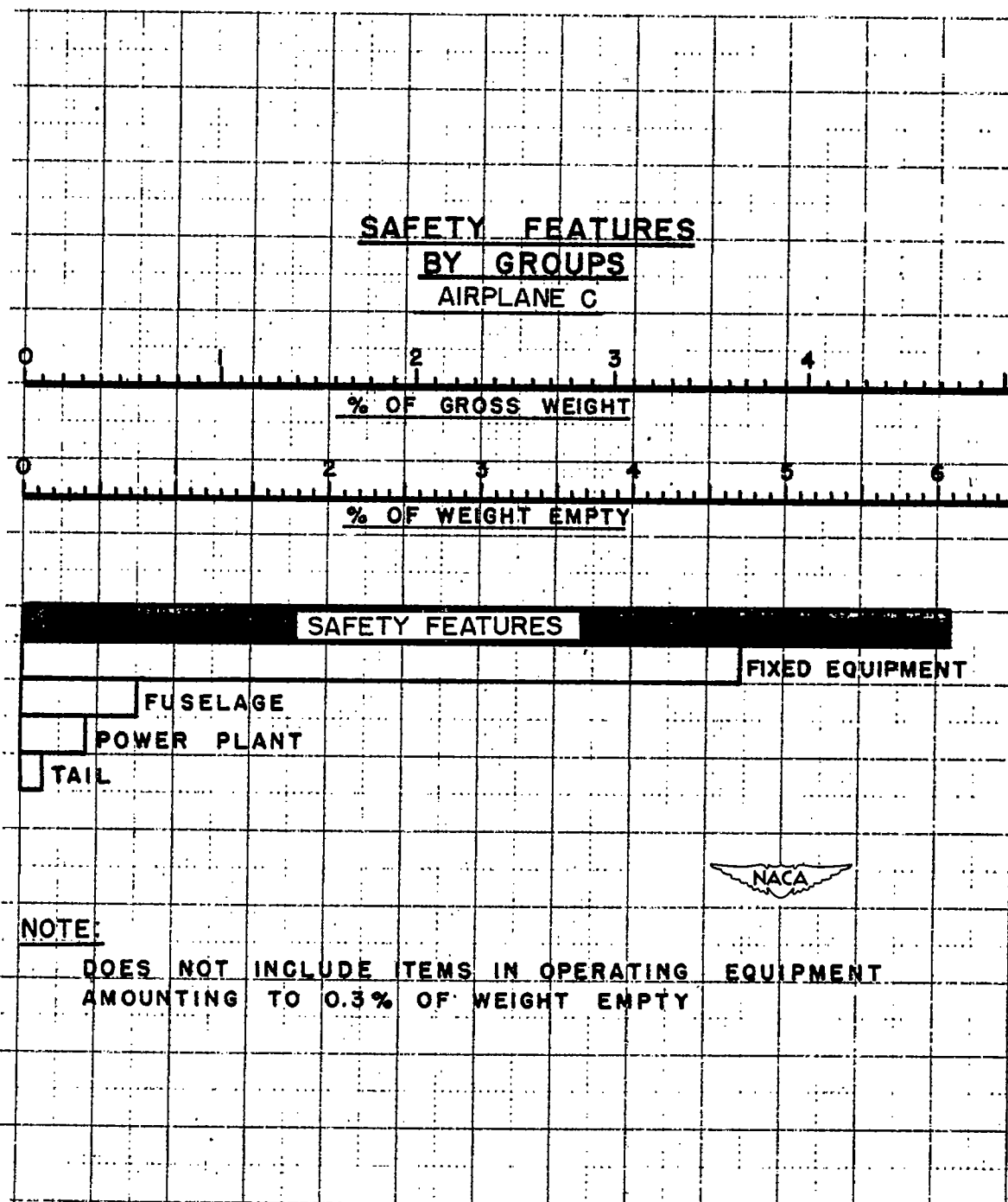


Chart C-14



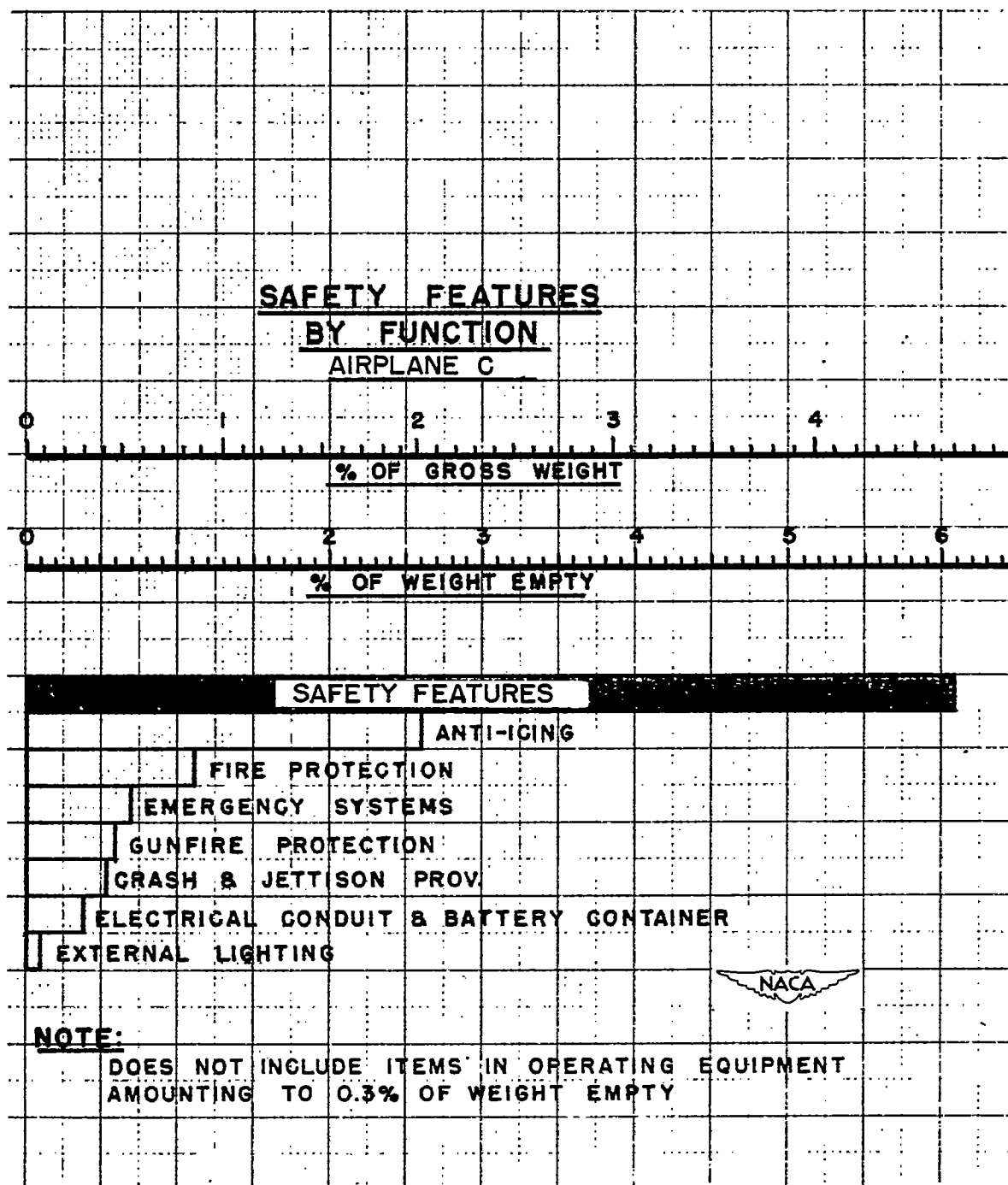
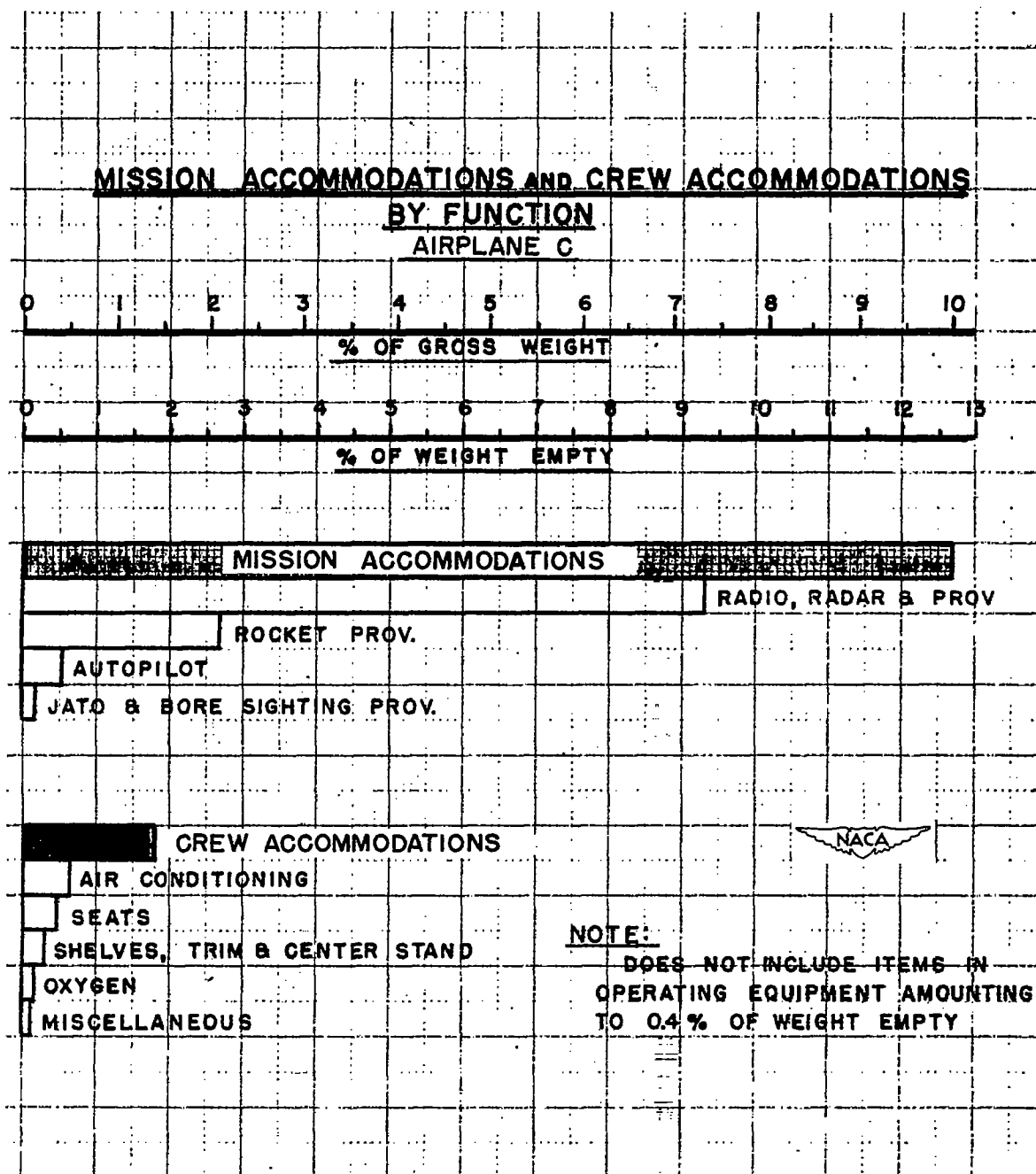
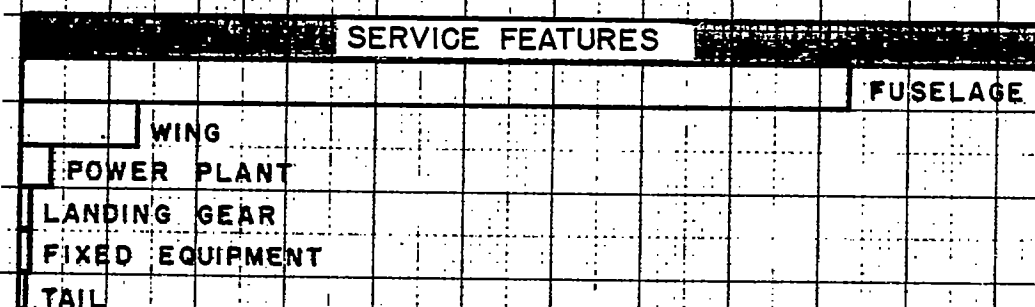
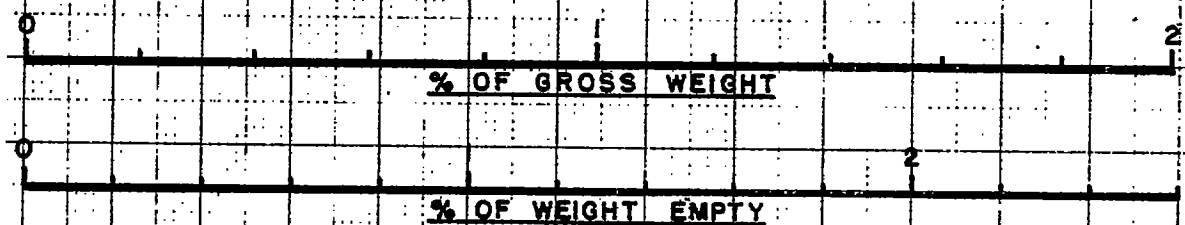


Chart C-16



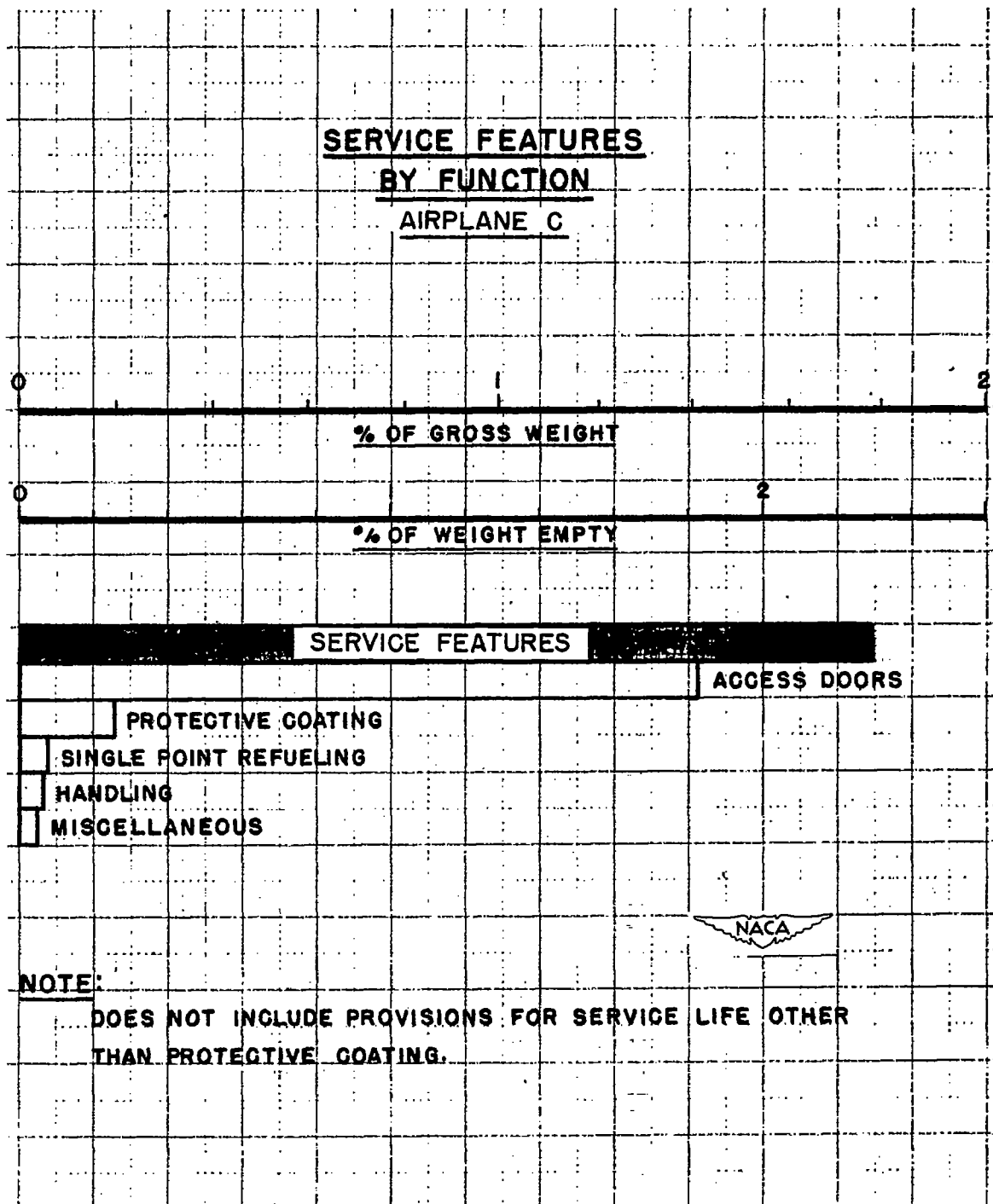
**SERVICE FEATURES
BY GROUPS
AIRPLANE C**



NOTE:

DOES NOT INCLUDE PROVISIONS FOR SERVICE LIFE OTHER THAN PROTECTIVE COATING.

Chart C-18



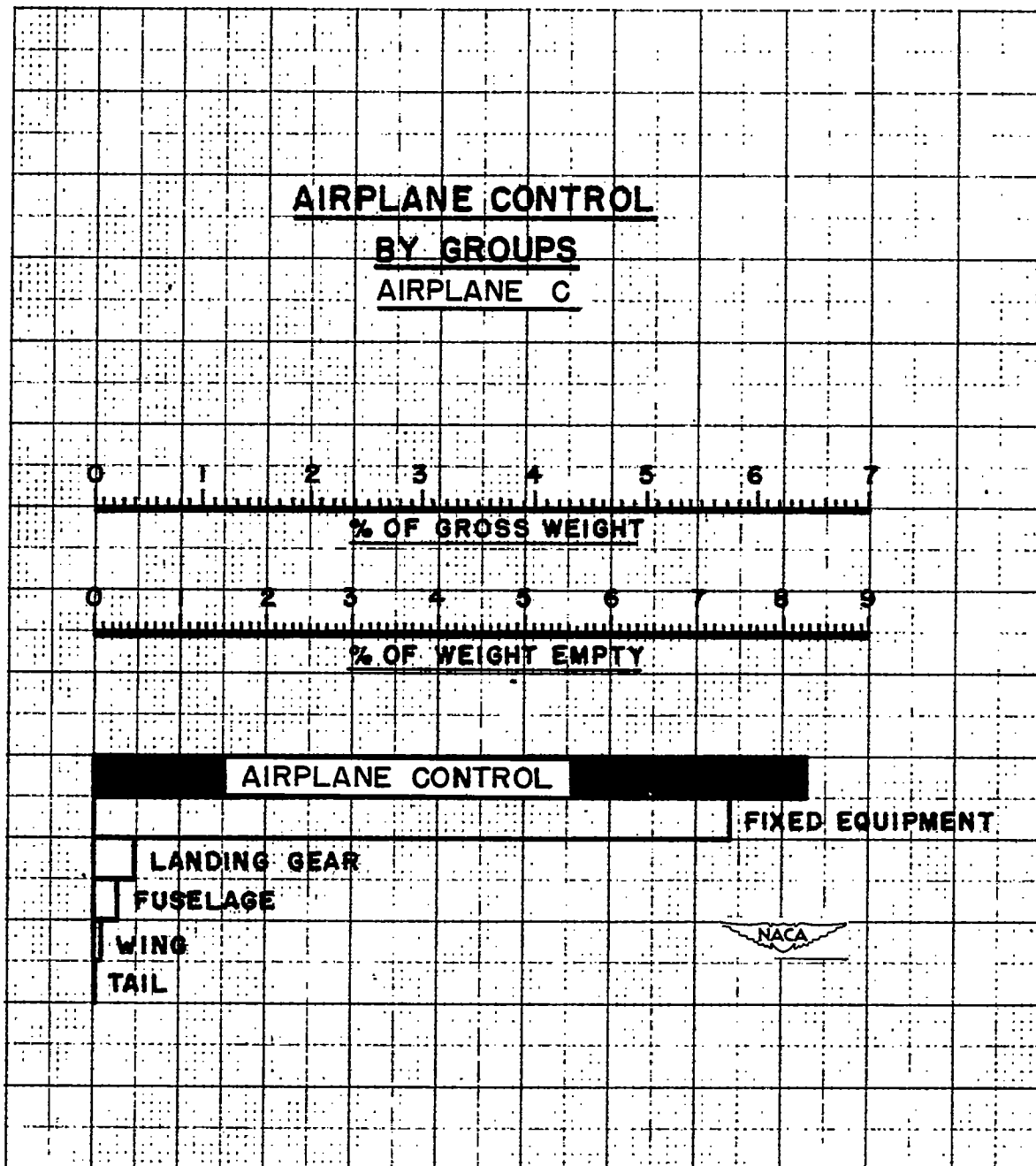


Chart C-20

